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USARTLYTR-78-23B - 181-20 INTERACTIONAL AERODYNAMICS OF THE SINGLE ROTOR HELICOPTER CONFIGURATION, 11-C. Harmonic Analyses of Airframe Surface Pressure Data, Runs 7-14, Aft Section . Philip F./Sheridan Boeing Vertol Company P.O. Box 16858 Philadelphia, Pa 19142 12) 218 p. Final Report Mar 77- Feb 15) DAAJP2-77-C-P92D Approved for public release; distribution unlimited. 16) 162622 P9AH76 | Prepared for APPLIED TECHNOLOGY LABORATORY U. S. ARMY RESEARCH AND TECHNOLOGY LABORATORIES (AVRADCOM) Fort Eustis, Va. 23604 7.8 11 13 05 8

# APPLIED TECHNOLOGY LABORATORY POSITION STATEMENT

In 1975 a wind tunnel test program was conducted in the Boeing-Vertol 20-foot V/STOL Wind Tunnel on a 1/5th-scale UTTAS model to investigate and find solutions for several aerodynamic problems encountered during the UTTAS flight-testing. Specifically, these tests focused upon (a) the structure of the hub/rotor wake in the vicinity of the empennage, (b) the formulation of the ground vortex and its relation to hub loads and fuselage loads during transition, and (c) the occurrence of vibratory air pressures from the blade passing over the fuselage. Only portions of the above-mentioned wind tunnel test data were reduced and analyzed in addressing the flight-test problems of the UTTAS aircraft.

Under Contract DAAJ02-77-C-0020, Boeing-Vertol completed analyses on the data to understand more completely the aerodynamic interactions that are involved and to formulate instructions for the guidance of designers in these respects. The results of these studies are applicable to all existing and future single-rotor/tail rotor helicopters. The data have been segregated according to aerodynamic interactions and associated phenomena/problem areas. From this body of knowledge, a generalized set of design guidelines meaningful to the single-rotor helicopter design concept formulation were developed and are included in these reports.

Mr. Robert P. Smith of the Aeronautical Technology Division, Aeromechanics Technical Area, served as project engineer for this effort.

#### DISCLAIMERS

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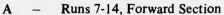
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# **PREFACE**

The entire report describing the investigation of INTERACTIONAL AERODYNAMICS OF THE SINGLE-ROTOR HELICOPTER CONFIGURATION comprises eight numbered volumes bound as 33 separate documents. The complete list of these documents is as follows:

#### Volume I, Final Report

Volume II, Harmonic Analyses of Airframe Surface Pressure Data



B - Runs 7-14, Mid Section

C - Runs 7-14, Aft Section

D - Runs 15-22, Forward Section

E - Runs 15-22, Mid Section

F - Runs 15-22, Aft Section

G - Runs 23-33, Forward Section

H - Runs 23-33, Mid Section

I - Runs 23-33, Aft Section

Volume III, Flow Angle and Velocity Wake Profiles in Low-Frequency Band

A - Basic Investigations and Hubcap Variations

B - Air Ejector Systems and Other Devices

Volume IV, One-Third Octave Band Spectrograms of Wake Split-Film Data

A - Buildup to Baseline

B - Basic Configuration Wake Explorations

C - Solid Hubcaps

D - Open Hubcaps

E - Air Ejectors

F - Air Ejectors With Hubcaps; Wings

G - Fairings and Surface Devices

Volume V, Harmonic Analyses of Hub Wake

Volume VI, One-Third Octave Band Spectrograms of Wake Single Film Data

A - Buildup to Baseline

B – Basic Configuration Wake Exploration

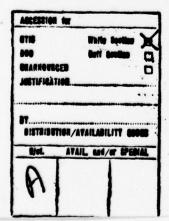
C - Hubcaps and Air Ejectors

Volume VII, Frequency Analyses of Wake Split-Film Data

A - Buildup to Baseline

B - Basic Configuration Wake Explorations

C - Solid Hubcaps



This volume is

D - Open Hubcaps

E - Air Ejectors

F - Air Ejectors With Hubcaps; Wings

G - Fairings and Surface Devices

Volume VIII, Frequency Analyses of Wake Single Film Data

A - Buildup to Baseline

B - Basic Configuration Wake Exploration

C - Hubcaps and Air Ejectors

# TABLE OF CONTENTS

INTR	ODU	CTION	•	•	•		•	•	•	•	•	•	•	•	•	•	•
LIST	OF	TEST	RU	NS	<b>(</b> T	ABLE	1	) .	•		•		•	•	•	•	8
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PRES	SURE	TRAI	NSDI	UCE	R	LOCA	TIC	ONS	<b>(</b> T	ABI	.E	2)			٠	•	12
SURF	ACE	PRES	SURI	E H	A'R	MONI	C A	ANAL	.YS	ES					•	•	14

# INTRODUCTION

Volume II summarizes the harmonic analyses of the airframe surface pressures measured at 53 locations on the fuselage, nacelles, and empennage of the model. These values are presented in nine volumes resulting from the following division of runs and pressures.

<u>Volume</u>	Runs	Pressure Section
II-A	7-14	Forward
II-B	u u	Mid
II-C		Aft
II-D	15-22	Forward
II-E	H	Mid
II-F	11	Aft
II-G	23-53	Forward
II-H	u	Mid
II-I		Aft

A computer printout sheet is provided for each pressure transducer for every run. The steady and ten harmonic components are given in pounds per square inch. The resultant and its phase angle are shown as well as the sine and cosine. A machine plotted time history with points every three degrees is offered for reference.

The parameters of any run may be found in the list of Test Runs (Table 1), a copy of which appears in each volume.

The designation (PS number) of the pressure sensors within each section are shown below.

Forward Section	Mid Section	Aft Section
004.1 013.1 013.2 013.3 015.1 017.1 017.2 017.3 017.4 017.5 017.6 017.7 023.1 023.2 023.3 023.4 023.5 026.1	045.1 045.2 047.1 047.2 048.1 048.2 048.3 052.1 052.2 056.1 056.2 056.3 057.1 057.2 071.1 072.2	081.1 081.2 081.3 099.1 099.2 099.3 107.1 107.2 107.3 107.4 107.5 107.6 112.1 112.2 117.1
	U	

The location of each transducer is shown in the scaled model drawing (Figure 1) and the listing of the transducer locations (Table 2).

The great majority of the pressure data points permitted usable harmonic analysis. Occasionally the computer program would skip a case with too many points beyond the valid voltage bandwidth of the measurement system. This is noted by the words "BANDEDGE". There are also a few cases where a very flat variation indicates an inoperative transducer.

		TAIL	ROTOR	o	=		•	Off				=	=		=
	MR HT.	p/q	8				E			=	E	=	u		
		MODEL	•	-6.5	=	=	-2.0	=	-15	-15	-6.5	-6.5	-2.0	-2.0	•
		MODEL	• 8	2.2	3.3	2.2	-3.5	=	-26.5	-26.5	2.2	3.3	-2.0	-3.5	
	SSURES	DISK	rbg.	8	01	8	•	=		•	=	10		8	น
33	SURFACE PRESSURES	RPM	MR/TR	1433/4500		-		1433/0						п	u
TABLE 1 OF TEST RUNS	ORY SUR	VTUN	KNOTS	09			160		60	:			160		=
TABLE 1 LIST OF TES	MEASUREMENT OF VIBRATORY	CONFIGURATION/CONDITTION		$K_{ m l}/(a)$ Level flight baseline	" /(b) Max. gross weight level flt. baseline	" /(a) Repeat 7(a)	" /(b) Increase speed to maximum	K <sub>2</sub> /Repeat high speed baseline with TR off	" /Max. climb at low speed	" /(a) Repeat 10; T.P. 2,3,4,5	" /(b) Repeat 7(a) with TR off, T.P. 6,7,8,9	" /(a) Repeat 7(b) with TR off	" /(b) Max. G.W. at max. speed with TR off	K2+S1/Check longitudinal strakes	K <sub>2</sub> +S <sub>2</sub> /Check lateral strakes
		RUN	NO.	7	:	8	:	6	10	11	1	12		13	14

	TAIL	ROTOR	Off			=				=			
	MR HT.	p/q	8	=		=							
	MODEL	9	-2.0	=	0	-2.0		=			=		
	MODEL	g	-3.5	=	21	-3.5	u	=		=			
ESSURES	DISK	pst.	8		8			u	=				
UED RUNS SURFACE PRESSURES	RPM	MR/TR	1433/0	=	=	u	11	u	u	=			
CONTINUED TEST RUN ATORY SUI	Vrun KNOTS		160	=	09	160	E .		=	=			
TABLE 1. CONTINUED LIST OF TEST RUNS MEASUREMENT OF VIBRATORY SURF	CONFIGURATION/CONDITION		K <sub>3</sub> /Effect of 45° tapered blade root cutout	$K_2 + VG_1/Effect$ of vortex generators on forward crown	K <sub>2</sub> /Autorotation	K <sub>2</sub> +S <sub>3</sub> /Effect of lower longitudinal strakes	$K_4/\mathrm{Rotor}$ raised 2.5 inches	K4+S3/Lower strakes added to rais- ed rotor	K <sub>5</sub> /Rotor raised 5.0 inches	K5+83/Lower strakes with rotor in highest position	K <sub>2</sub> /Autorotation at maximum speed		
	RUN	NO.	15	16	17	18	19	20	21	22	23		

	TAIL		Off	=		=			=		=	=	
	MR HT.	h/d	8	=					-		=		
	EL	9	0	=	E		5.9-	-3.2	-2.3	-2.2	-2.1	-1.9	
	MODEL	<b>8</b>	5.3	5.0	4.4	3.5	2.2	0.2	9.0-	-1.6	-2.7	-3.5	
SSURES	DISK	LDG.	8	=					=	=	=		
IS	RPM	MR/TR	1433/0	=				=	=	=	=		
CONTINUED TEST RUN	Vrun Knots		20	30	40	50	09	80	100	120	140	160	
TABLE 1. CONTINUED  LIST OF TEST RUNS  MEASUREMENT OF VIBRATORY SURFACE PRESSURES	NOT#IGNOS/NOT##########	MOTITAGE AND CONTINUO	K2/Level flight speed sweep	: :				: :	= =	= = =	=		
	RUN	NO.	24	25	26	27	28	29	30	31	32	33	

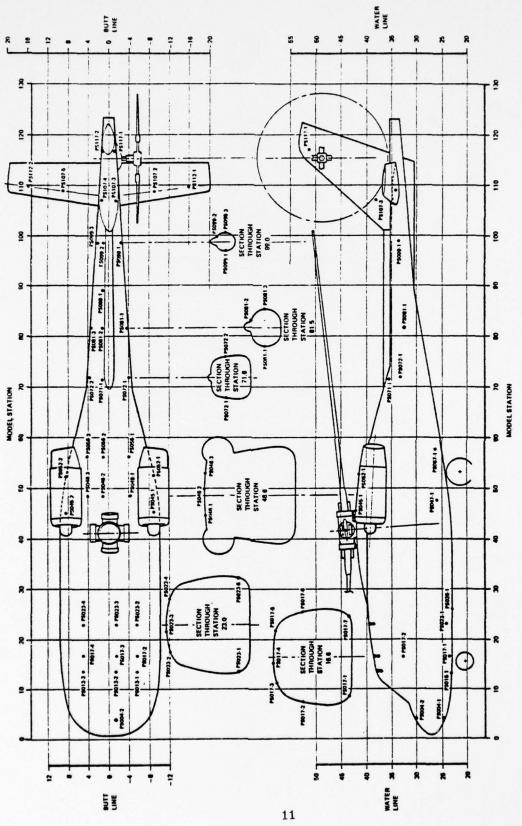


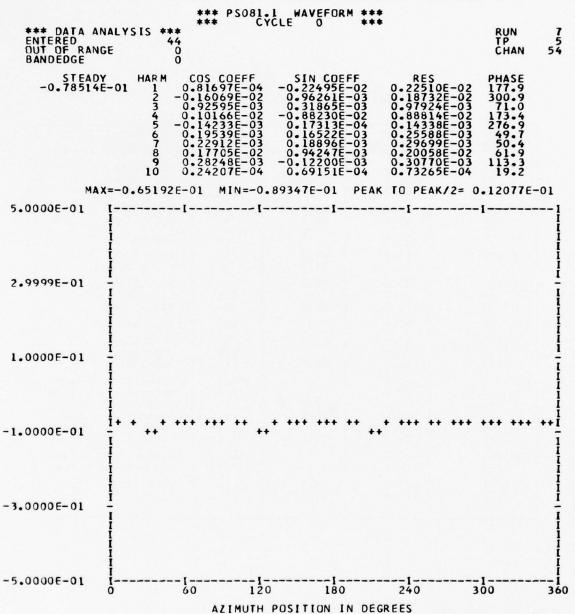
FIGURE 1 -1/4.85 SCALE MODEL GEOMETRY AND SURFACE PRESSURE TRANSDUCER LOCATIONS

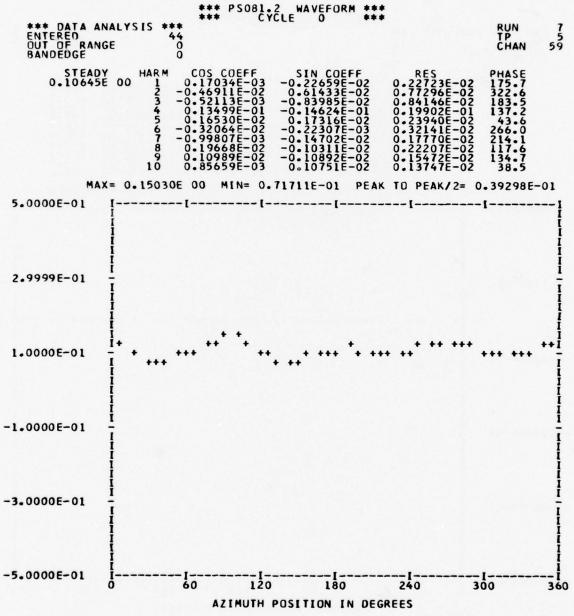
TABLE 2
PRESSURE TRANSDUCER LOCATIONS

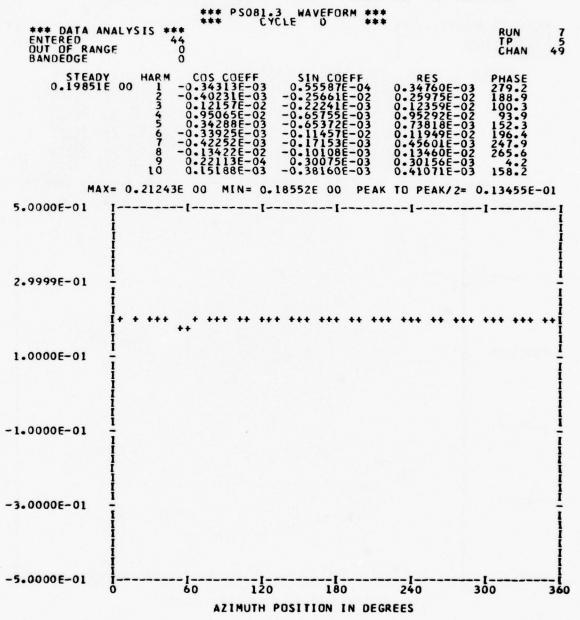
TRANSDUCER DESIGNATION	MODEL STATION	WATER LINE	BUTT	LOCATION DESCRIPTION
PS004-1 -2	4.0	=	-1.2 -1.2	Lower Surface Upper Surface
PS013-1 -2 -3	13.4 13.4 13.4	=	-5.3 -1.2 5.2	Forward Crown Forward Crown Forward Crown
PS015-1	13.4	-	-1.2	Lower Surface
PS017-1 -2 -3 -4 -5 -6 -7	16.6 16.6 16.6 16.6 16.6 16.6	24.2 33.4 - - 33.4 24.2	-5.3 -1.2 5.2	Left Side Left Side Forward Crown Forward Crown Porward Crown Right Side Right Side
PS023-1 -2 -3 -4 -5	23.0 23.0 23.0 23.0 23.0	25.9	-5.3 -1.2 5.2	Left Side Forward Crown Forward Crown Forward Crown Right Side
PS026-1	26.0	-	-1.2	Under Surface
PS045-1 -2	45.4 45.4	:	-8.7 8.7	Top of Nacelle
PS047-1 -2	47.4	26.6 26.6	:	Left Side Right Side
PS048-1 -2 -3	48.6 48.6 48.6	:	-3.9 1.2 4.4	Aft Crown Aft Crown Aft Crown
PS052-1 -2	52.6 52.6	:	-8.7 8.7	Top of Nacelle

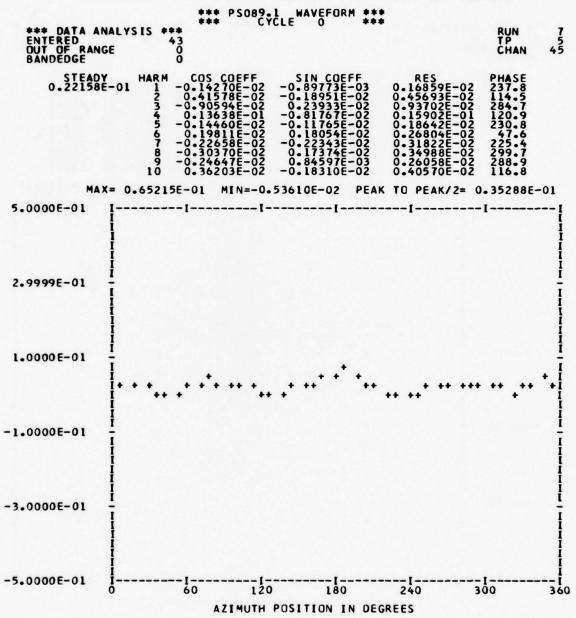
TABLE 2 (CONTINUED)
PRESSURE TRANSDUCER LOCATIONS

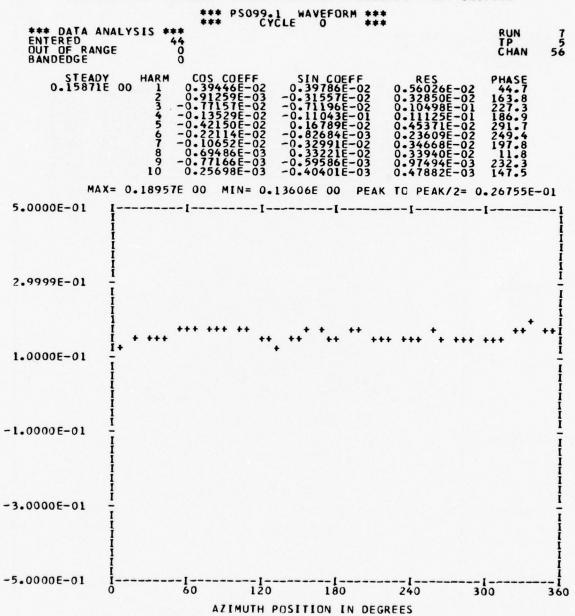
TRANSDUCER DESIGNATION	MODEL STATION	WATER LINE	BUTT	LOCATION DESCRIPTION
PS056-1 -2 -3	56.2 56.2 56.2	2 :	-3.9 1.2 4.4	Aft Crown Aft Crown Aft Crown
PS057-1 -2	57.4 57.4	27.0 27.0	:	Left Side Right Side
PS071-1	71.4	-	1.2	Top Surface
PS072-1 -2	71.6	28.9 28.9	:	Left Side Right Side
PS081-1 -2 -3	81.5 81.5 81.5	28.9	1.2	Left Side Top Surface Right Side
25089-1	89.4	_	1.2	Top Surface
PS099-1 -2 -3	99.0 99.0 99.0	28.9	1.2	Left Side Top Surface Right Side
PS107-1 -2 -3 -4 -5 -6	109.5 109.5 109.5 109.5 109.5 109.5	38.7 38.7	-8.6 -8.6 - 8.6 8.6	Lower Surf Stab. Upper Surf Stab. Left Side - Fin Right Side - Fin Upper Surf Stab. Lower Surf Stab.
PS112-1 -2	110.3	:	-15.9 15.9	Upper Surf Stab. Upper Surf Stab.
PS117-1 -2	117.0	47.7 47.7	:	Left Side - Fin Right Side - Fin

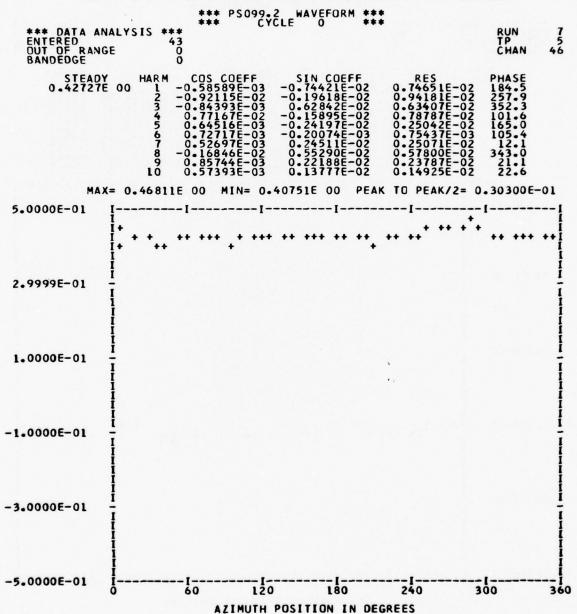


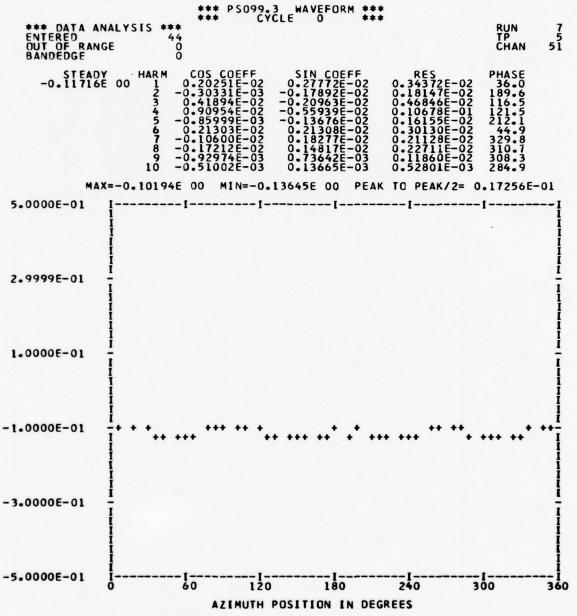


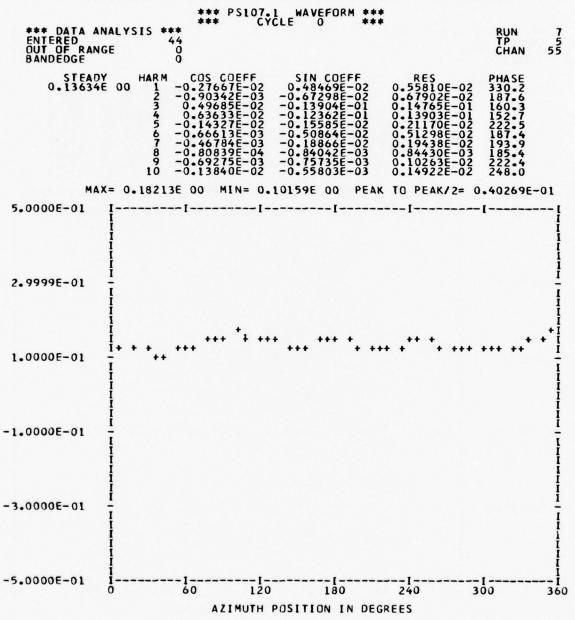


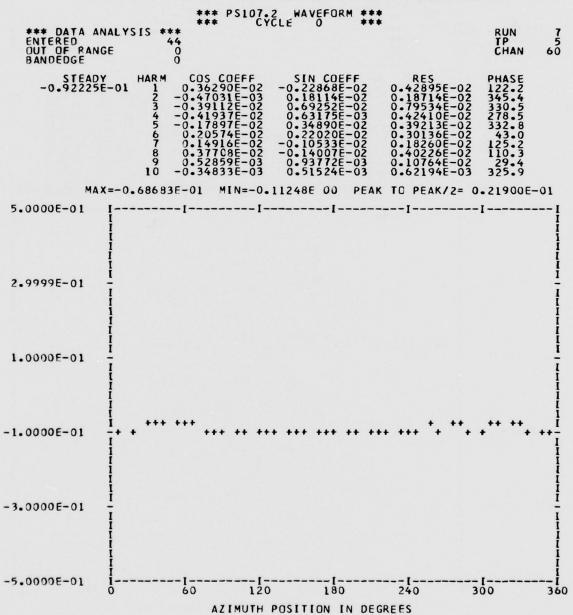




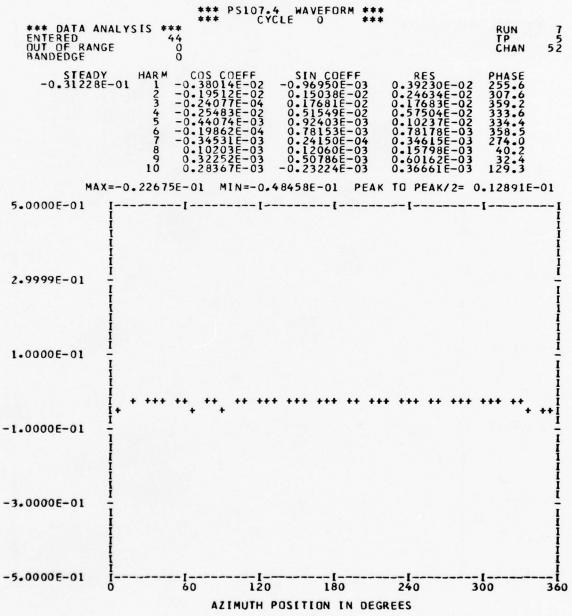


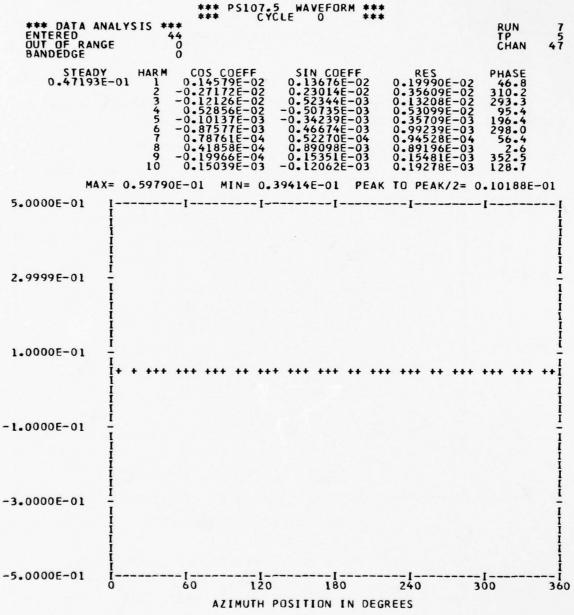






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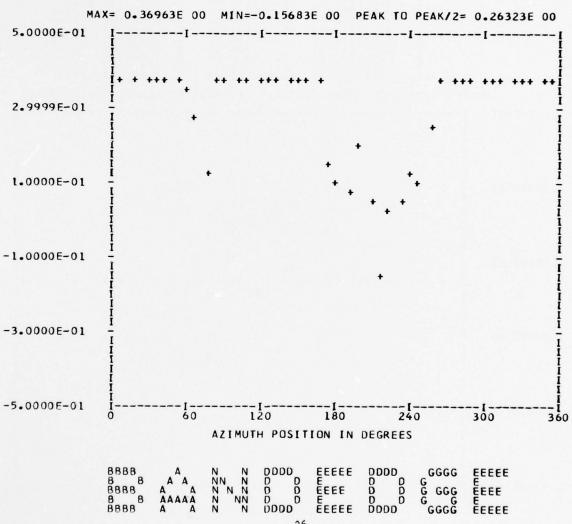
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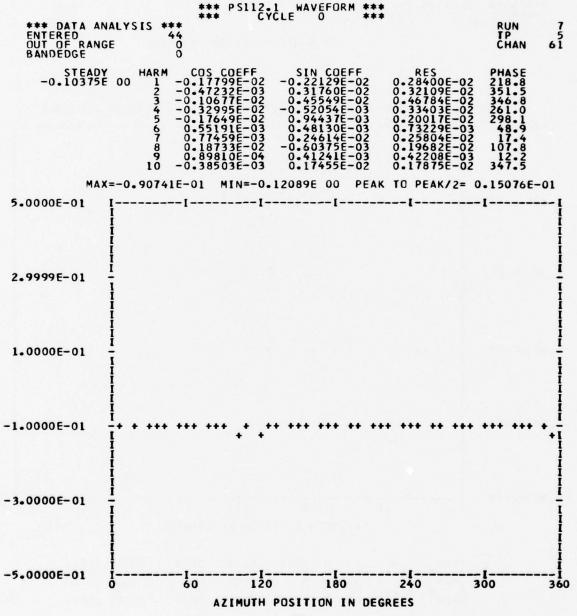
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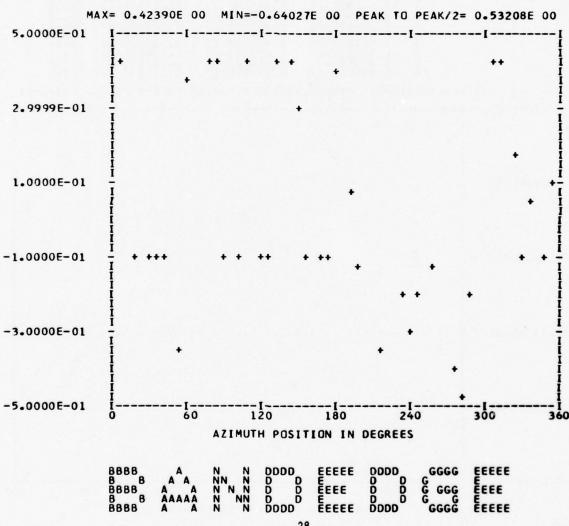
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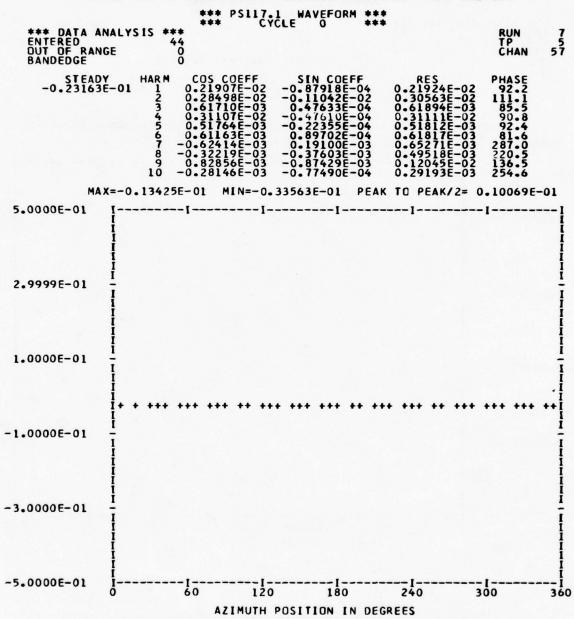




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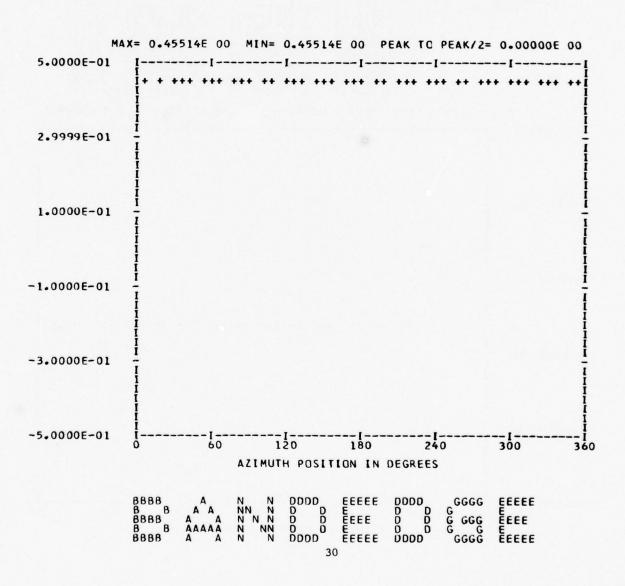
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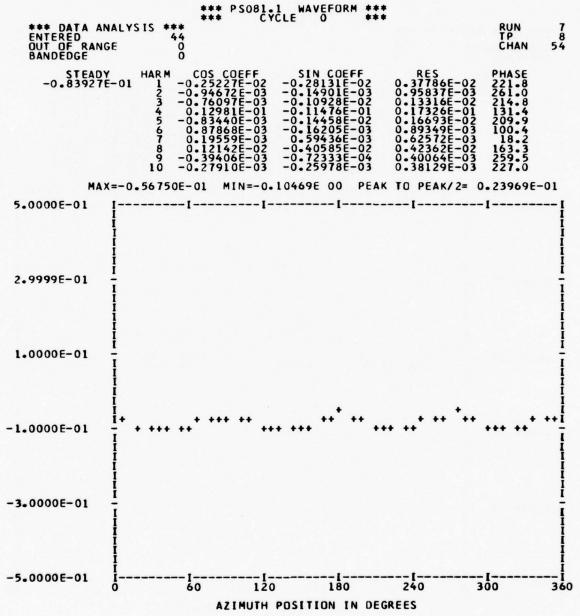
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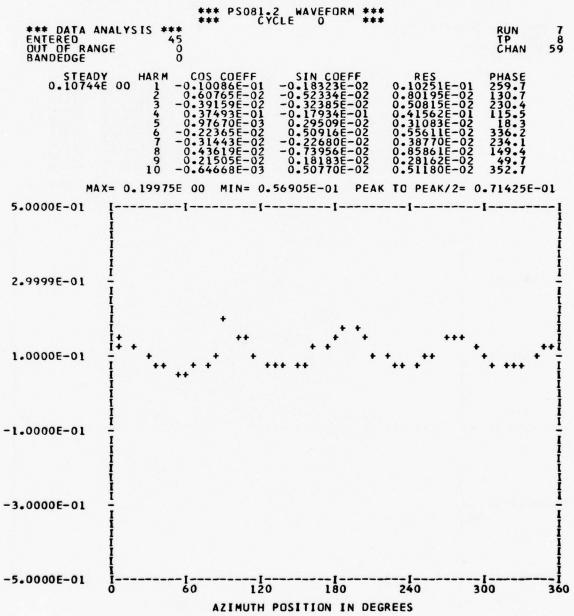
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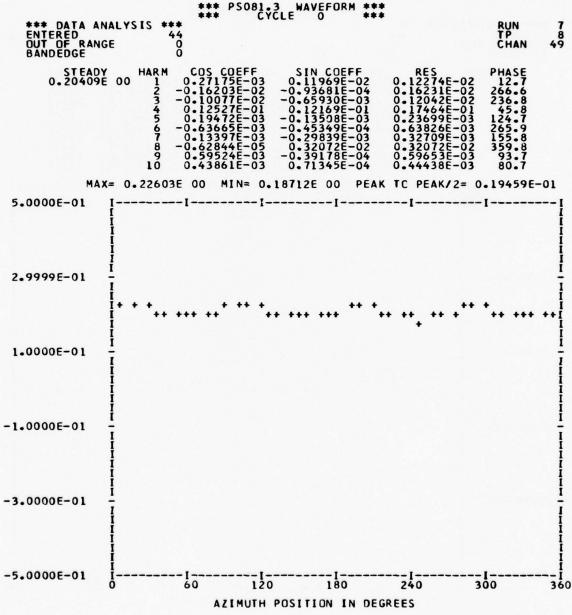
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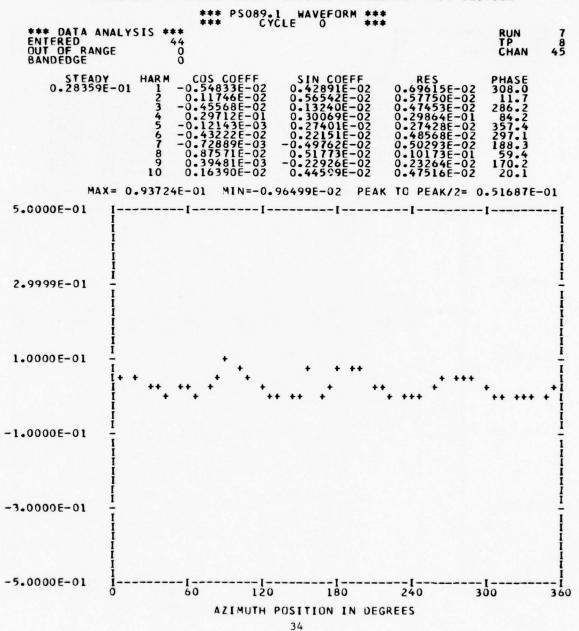
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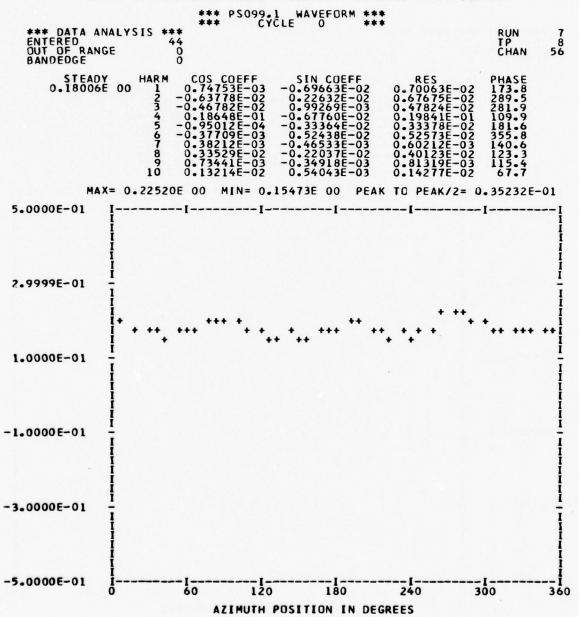


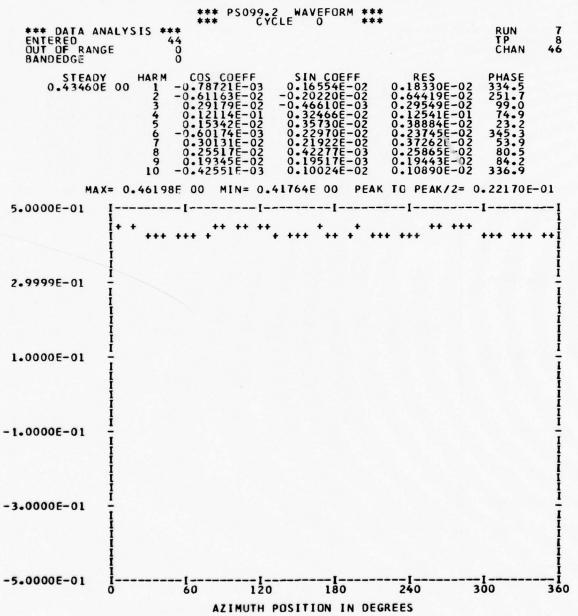




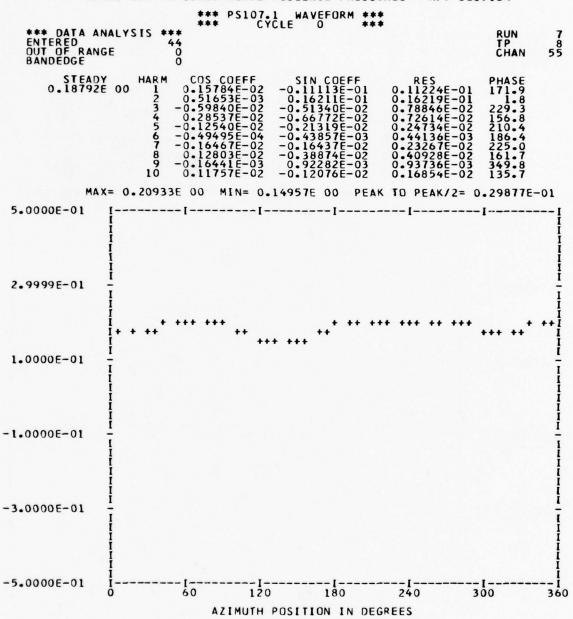


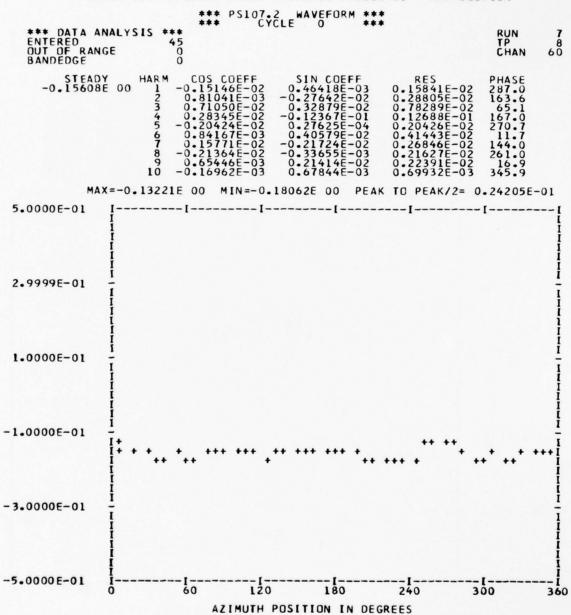


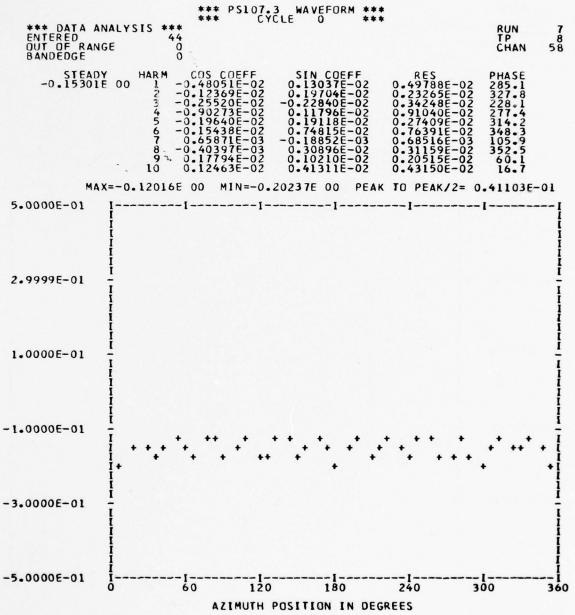


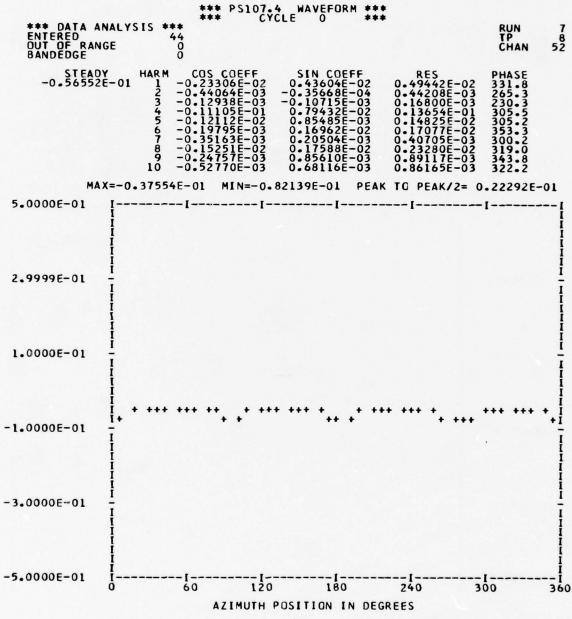


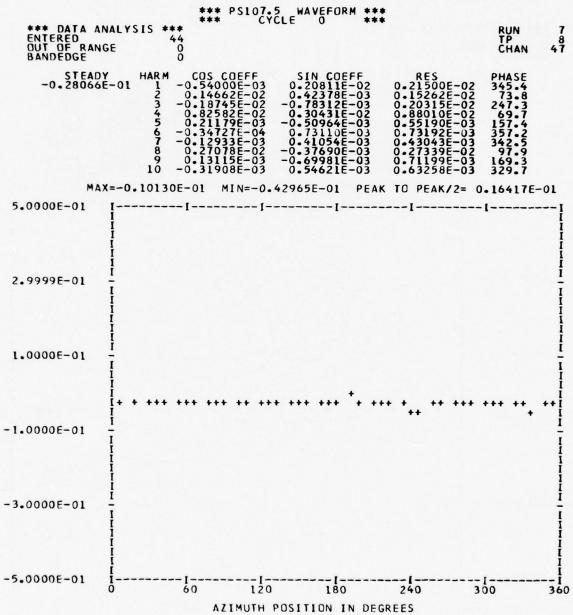
*** DATA ANALY ENTERED OUT OF RANGE BANDEDGE	*** PS099.3 WAVEFORM ***  *** CYCLE 0 ***  SIS *** 44 0 0	RUN TP CHAN	7 8 51
STEADY -0.76629E-01	1 0.66360E-02 -0.66225E-02 0.93752E-02 2 -0.17290E-02 0.42311E-02 0.45707E-02 3 0.29285E-02 -0.25140E-02 0.38595E-02 4 0.10077E-01 0.23888E-02 0.10356E-01 5 -0.14302E-02 0.27304E-02 0.30824E-02	PHASE 134.9 337.7 130.6 76.6 332.3 214.5 73.7 353.7 353.7 325.2	
	0.47734E-01 MIN=-0.11446E 00 PEAK TO PEAK/2= 0.	33365E-	01
5.0000E-01 I	[[[[[[		<u>I</u>
2.9999E-01			
1.0000E-01			I I I I I
-1.0000E-01	* * *. * ** ** **	** ***	
-3.0000E-01			
-5.0000E-01 I	III 60 120 180 240 30	0	I 360
	AZIMUTH POSITION IN DEGREES		



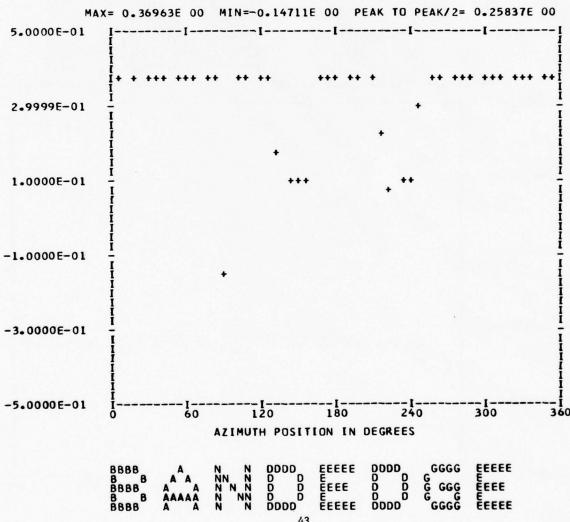


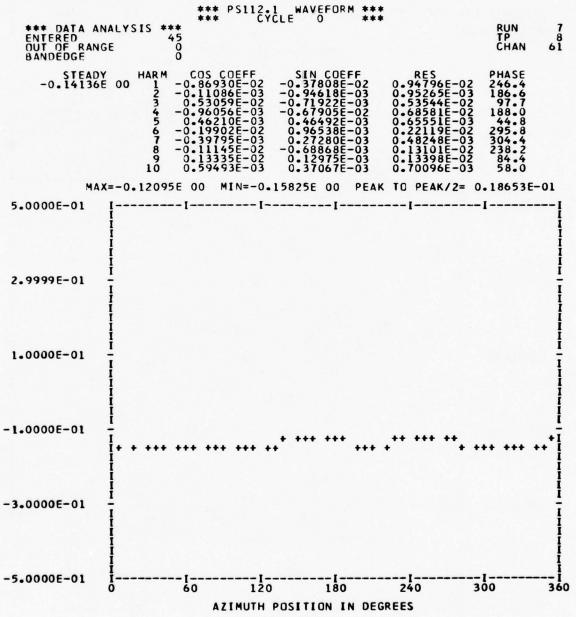


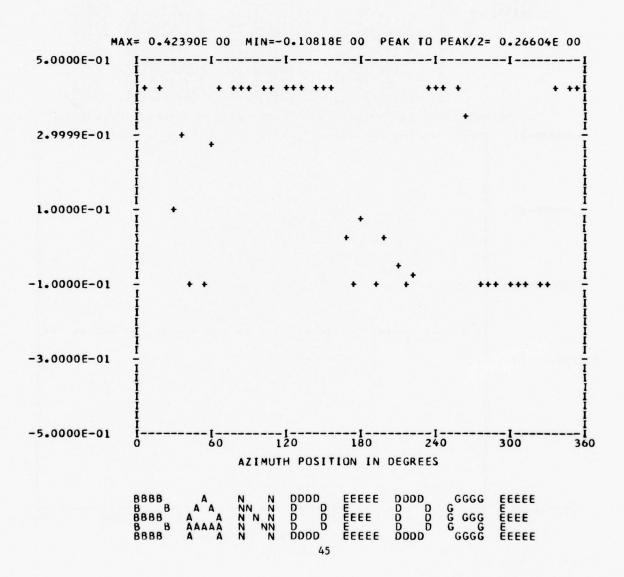


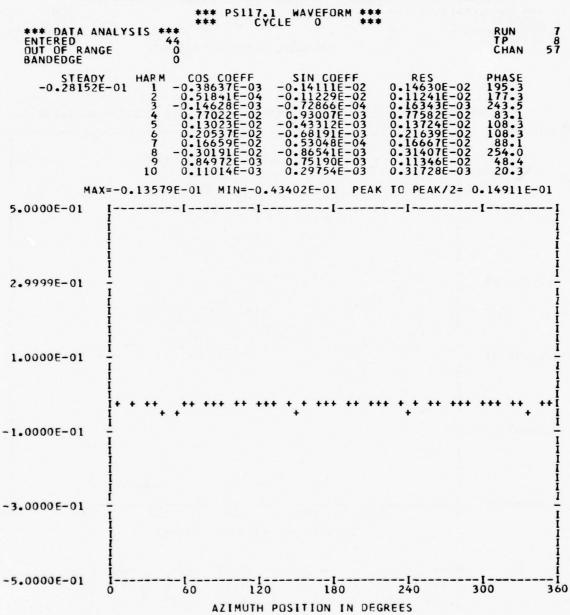


\*\*\* PS107.6 WAVEFORM \*\*\*
CYCLE 0 \*\*\* \*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 33 HARMONIC ANALYSIS SKIPPED





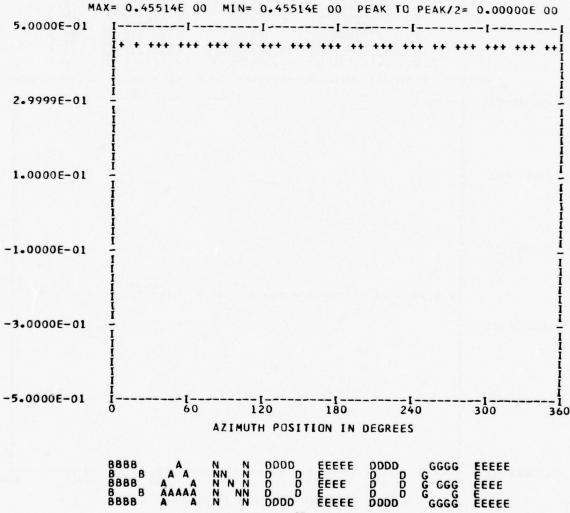


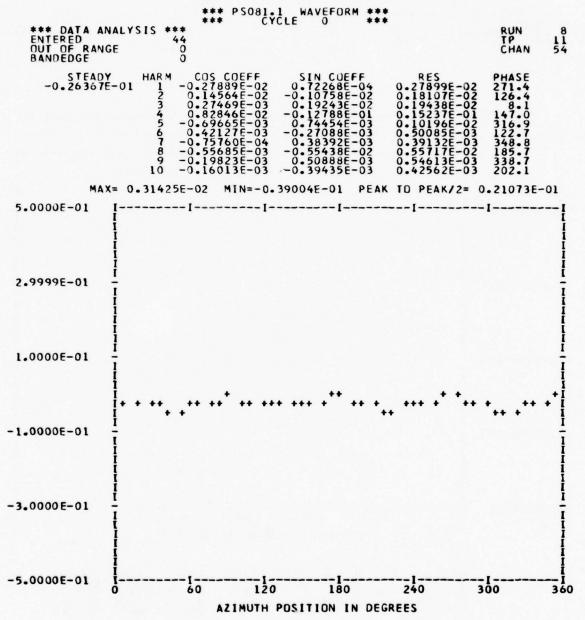


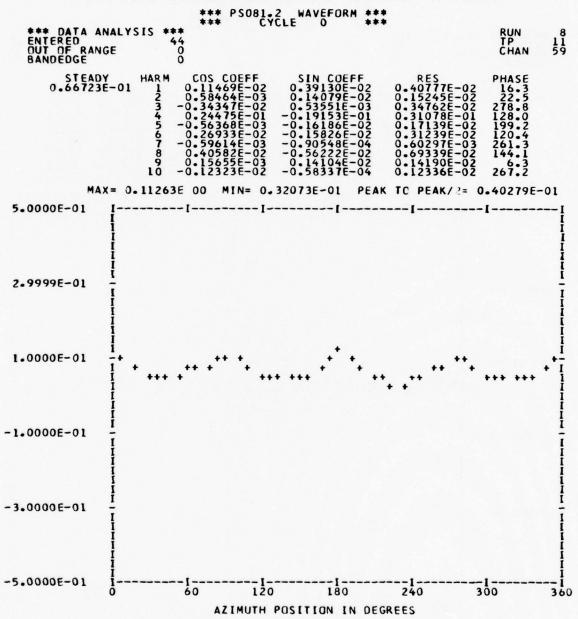
\*\*\* PS117.2 WAVEFORM \*\*\*

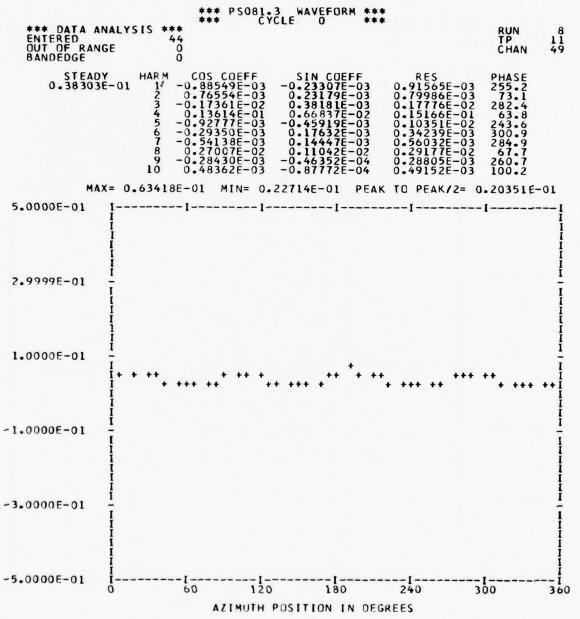
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

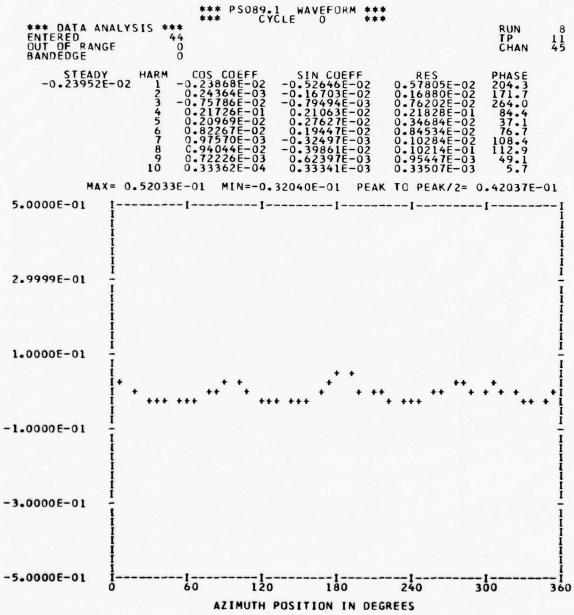
HARMONIC ANALYSIS SKIPPED

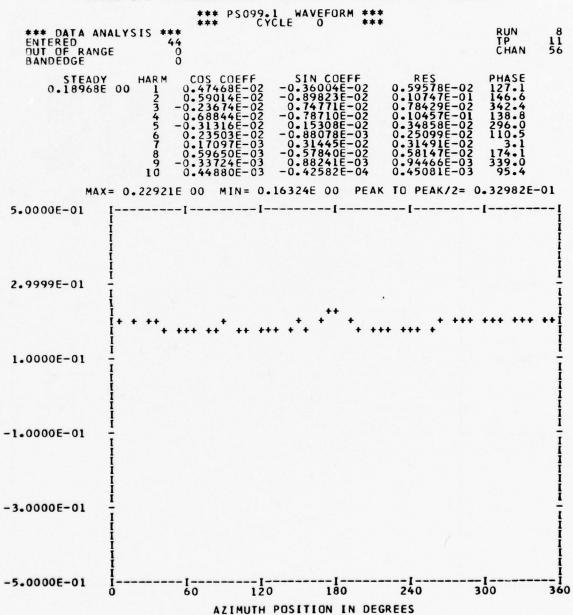


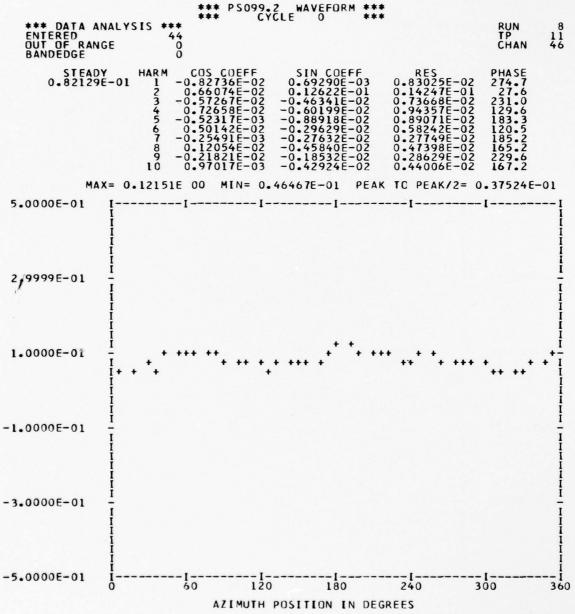


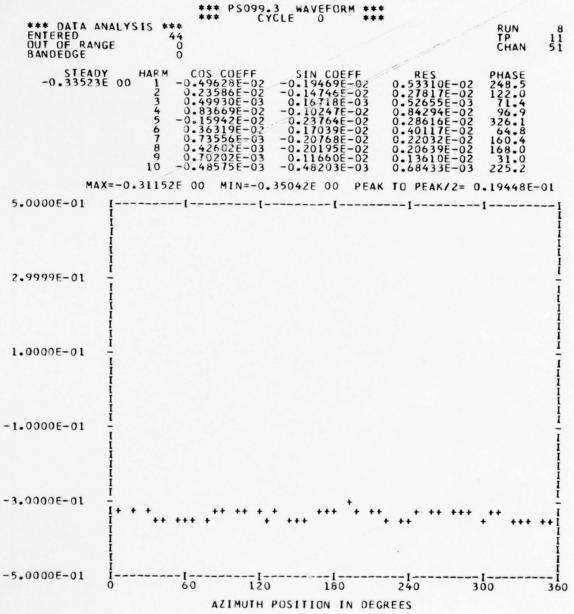


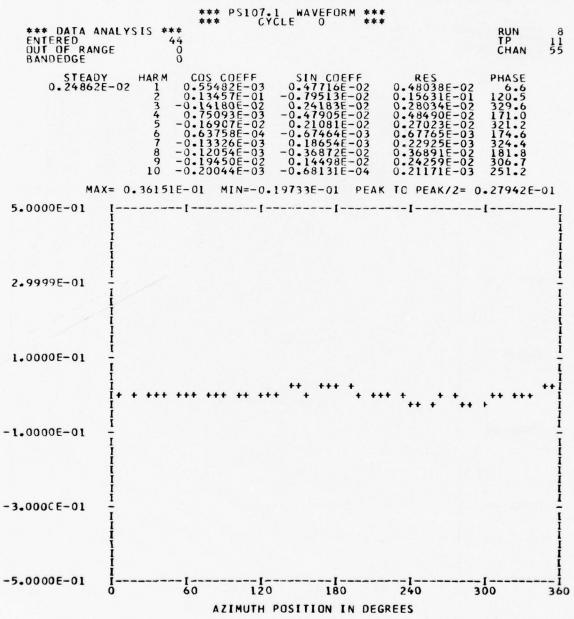


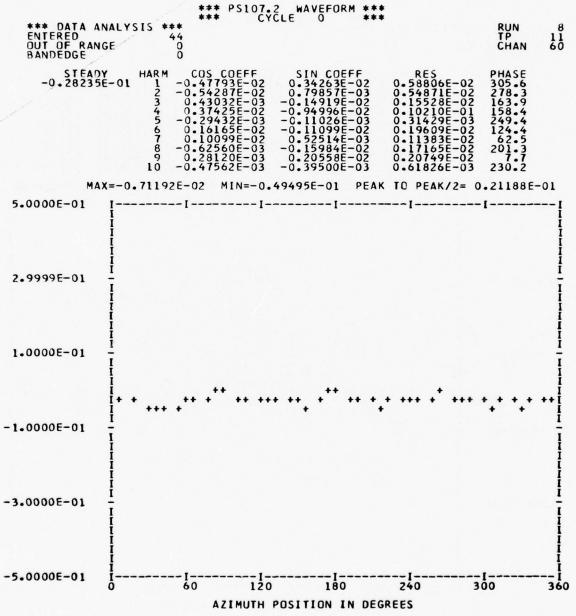


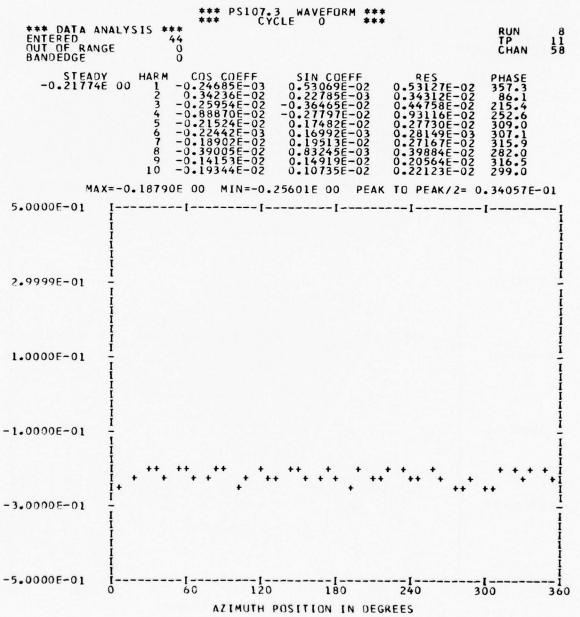


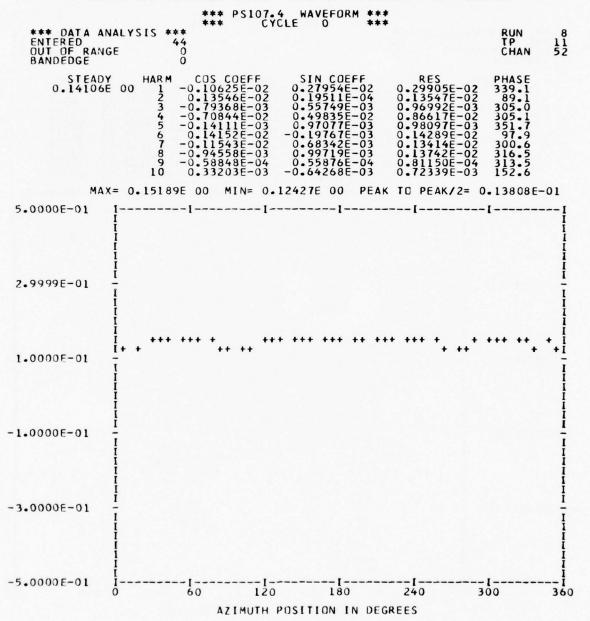


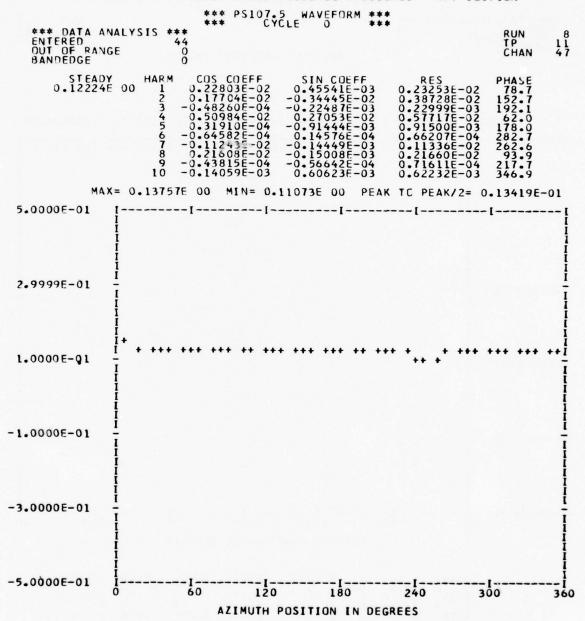












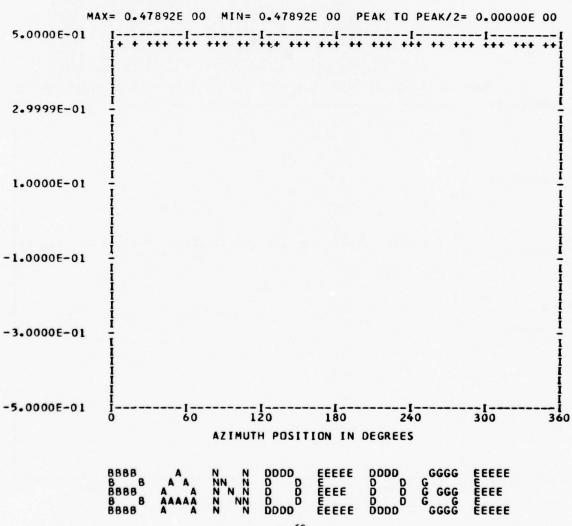
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

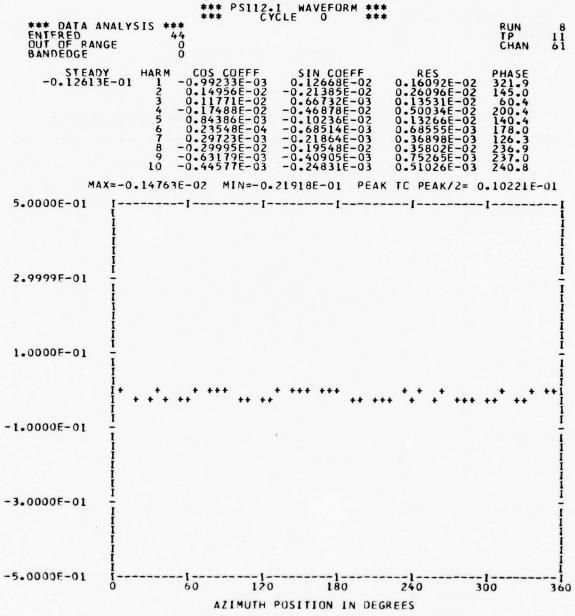
\*\*\* PS107.6 WAVEFORM \*\*\*

\*\*\* CYCLE 0 \*\*\*

RUN 8 TP 11 CHAN 50

HARMONIC ANALYSIS SKIPPED





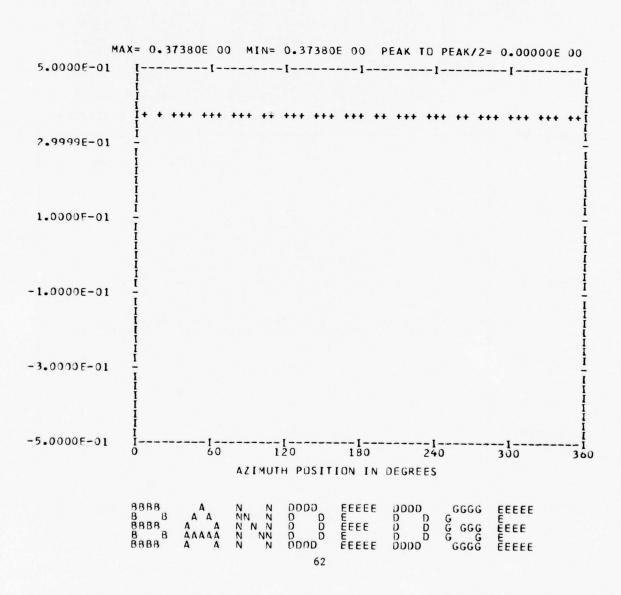
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

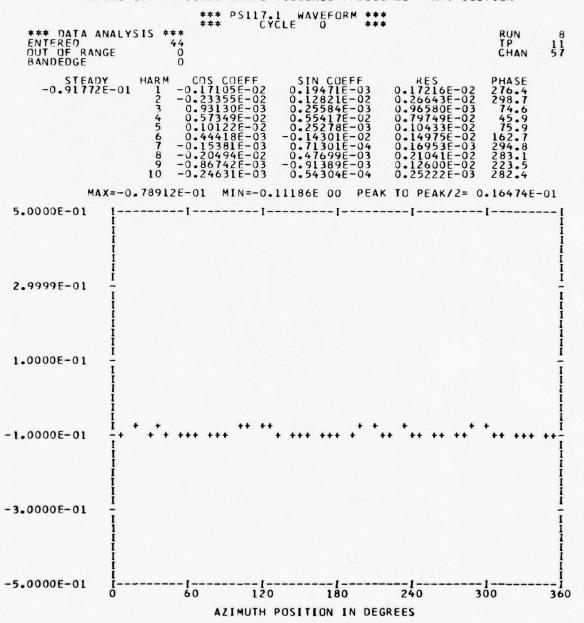
\*\*\* PS112.2 WAVEFORM \*\*\*

\*\*\* CYCLE 0 \*\*\*

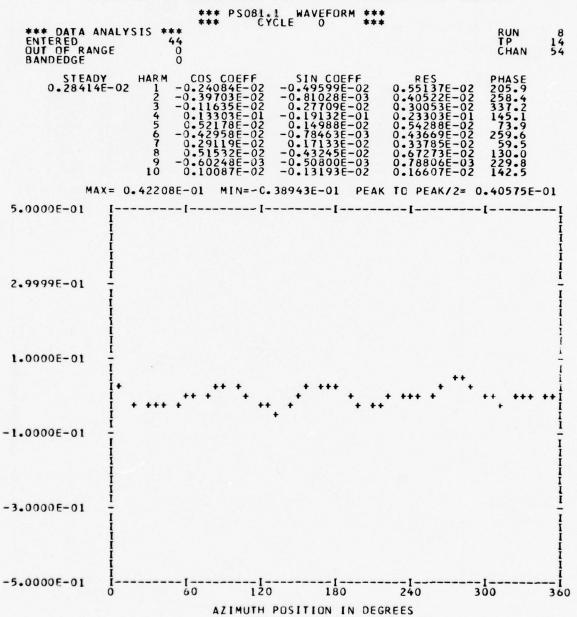
RUN 8 TP 11 CHAN 48

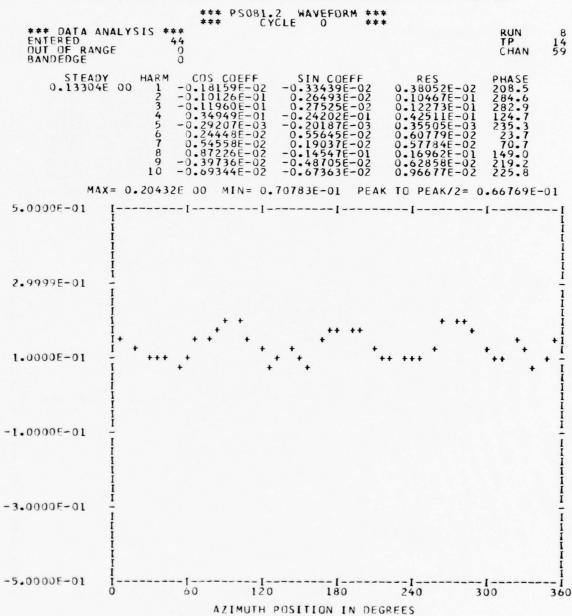
HARMONIC ANALYSIS SKIPPED

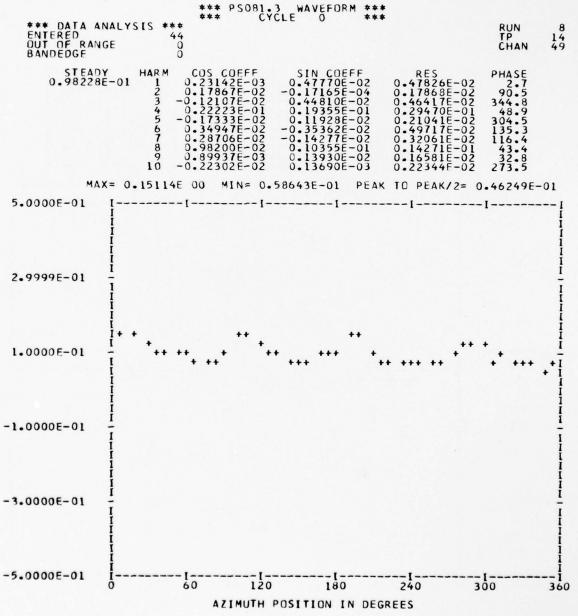


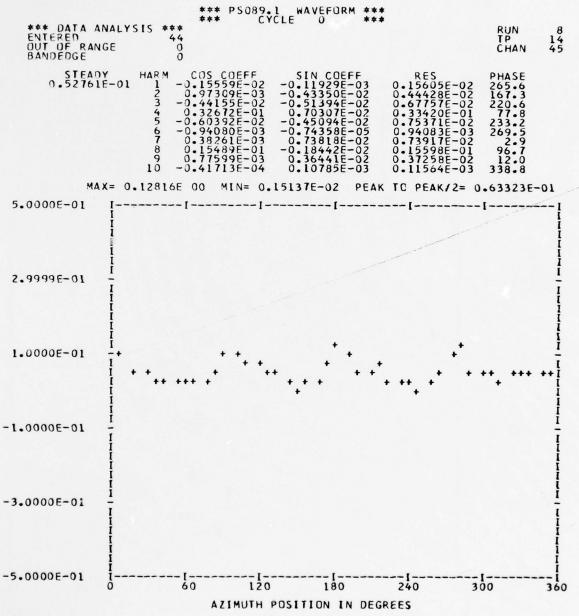


*** PS117.2 WAVEFORM ***  *** CYCLE 0 ***		
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	8 11 53
STEADY HARM COS COEFF -0.19861E-02 0.23793E-02 0.12517E-02 -0.50521E-03 0.13498E-02 0.24778E-03 0.86450E-03 0.89931E-03 0.16461E-02 0.10125E-02 0.19326E-02 0.14800E-03 -0.59053E-03 0.60879E-03 0.26478E-04 -0.74719E-03 0.74766E-03 7 -0.16610E-03 0.29356E-03 0.32863E-03 0.32863E-03 0.32863E-03 0.26451E-03 -0.20820E-03 0.47462E-03 10 -0.75823E-04 0.82413E-04 0.11198E-03	PHASE 146.5 248.0 344.0 58.4 165.9 177.9 329.6 260.1 116.0 317.3	
MAX=-0.23723E 00 MIN=-0.25261E 00 PEAK TC PEAK/2= 0.	76864E-	02
5.0000E-01		I
1		I I I I I
I I I I I -1.0000€-01		I I I I I
 	•• •••	I I I I I I I I
-3.0000E-01 - I I I I I I I I I I I I I I I I I I		
-5.0000E-01	0	i 360

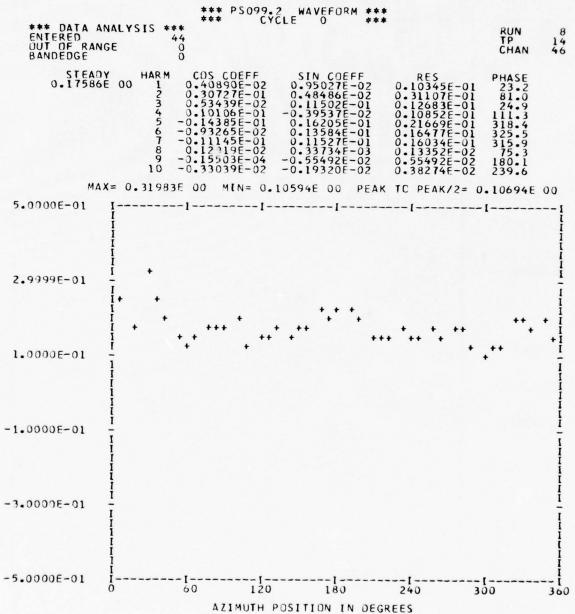






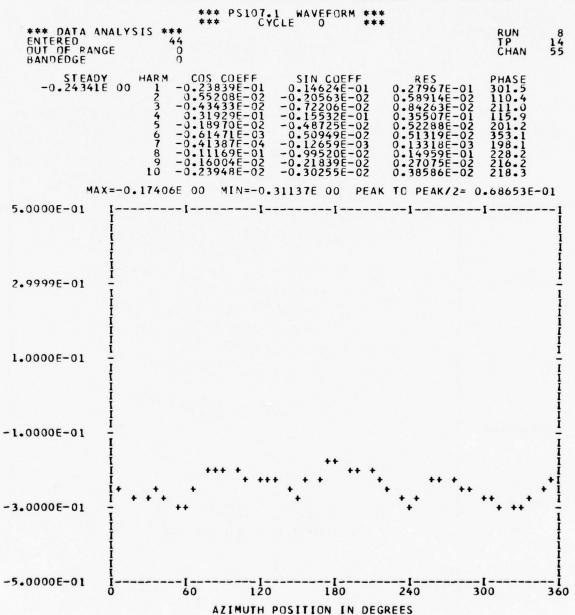


*** PS099.1 WAVEFORM ***		
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	8 14 56
STEADY HARM COS COEFF 0.58620E-02 0.59493E-02 0.23957E 00 1 0.10150E-02 0.58620E-02 0.59493E-02 0.17549E-02 -0.4770E-02 0.49259E-02 0.13948E-01 -0.13326E-01 0.19291E-01 0.13948E-01 -0.13326E-01 0.19291E-01 0.26029E-02 -0.73117E-02 0.77612E-02 0.33448E-02 -0.34803E-02 0.48270E-02 0.996668E-03 -0.57227E-02 0.58038E-02 0.23740E-02 -0.38089E-02 0.44882E-02	PHASE 9.8 201.6 230.8 133.6 326.3 199.5 136.1 143.3 189.5 148.0	
MAX= 0.29745E 00 MIN= 0.19438E 00 PEAK TC PEAK/2= 0		
5.0000E-01	I	I I I I I I I
2.9999E-01 - I + + + + + + + + + + + + + + + + + +	··· *··	+ 1 + 1   1   1   1   1   1   1   1   1
1.0000E-01 - I		I
-1.0000E-01		I
-3.0000E-01		
-5.0000E-01 1	00	i 360



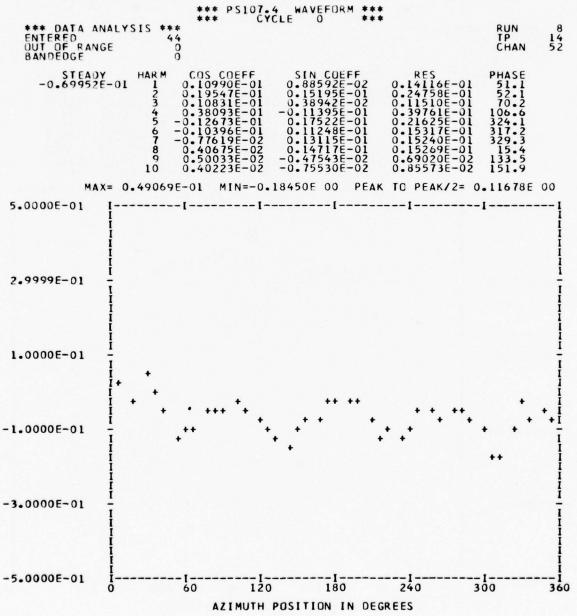
UTTAS 1/5 TH SCALE MODEL FUSELAGE PRESSURES---AFT SECTION \*\*\* PS099.3 WAVEFORM \*\*\*

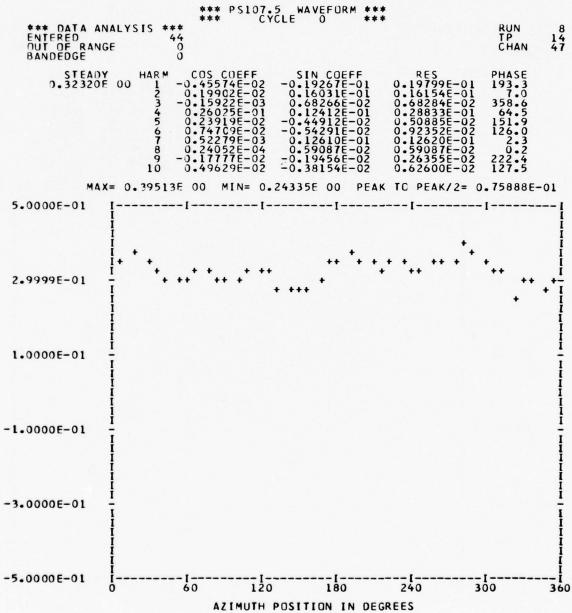
CYCLE 0 \*\*\* HARMONIC ANALYSIS SKIPPED MAX=-0.40574E 00 MIN=-0.78024E 00 PEAK TO PEAK/2= 0.18725E 00 5.0000E-01 2.9999E-01 1.0000E-01 -1.0000E-01 -3.0000E-01 -5.0000E-01 60 120 180 240 300 AZIMUTH POSITION IN DEGREES 



*** PS107.2 WAVEFORM *** *** CYCLE 0 ***		
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	8 14 60
STEADY HARM COS COEFF SIN COEFF 0.30969E-01 0.22605E-01 -0.21168E-01 0.30969E-01 0.19634E-01 0.19634E-01 0.60499E-02 0.10666E-01 0.12262E-01 0.52404E-02 0.61639E-02 0.84166E-02 -0.87791E-02 0.12161E-01 0.50449E-02 -0.31688E-02 0.59575E-02 0.313423E-01 0.14429E-01 0.13363E-02 0.13942E-01 0.14406E-01 0.19439E-02 0.98532E-03 0.21794E-02	PHASE 133.1 189.8 29.5 136.2 237.8 21.5 91.2 63.1	
MAX= 0.22428E 00 MIN= 0.59055E=01 PEAK TO PEAK/2= 0.		01
2.9999E-01	+ ++	
-1-30000-1- I I I I I		I I I I I
-3.0000E-01		I
-5.0000E-01	0	I 360
AZIMUTH POSITION IN DEGREES		

*** PS107.3 WAVEFORM ***  *** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	8 14 58
STEADY HARM COS COEFF SIN COEFF 0.50115E-02 0.55805E-02 0.24549E-01 0.10422E-01 0.15781E-01 0.26686E-01 0.266451E-01 0.35364E-02 0.26686E-01 0.15737E-01 -0.96931E-03 0.15767E-01 0.86450E-03 -0.71824E-02 0.72343E-02 0.79310E-03 0.21877E-02 0.23271E-02 0.79310E-03 0.21877E-02 0.23271E-02 0.59790E-02 -0.50154E-02 0.78040E-02 10 0.17475E-01 -0.11867E-01 0.21124E-01	PHASE 333.9 311.3 82.3 93.5 333.3 173.1 19.9 319.3 129.9 124.1	
MAX=-0.19685E 00 MIN=-0.41401E 00 PEAK TO PEAK/2= 0	.10858E	00
5.0000E-01	I	1
$1.0000E-01$ $\frac{I}{2}$		<u>I</u>
		I I I I I
-1.0000E-01		I I I I
-3.0000E-01	· .·	+ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-5.0000E-01	1	I 360
AZIMUTH POSITION IN DEGREES		300

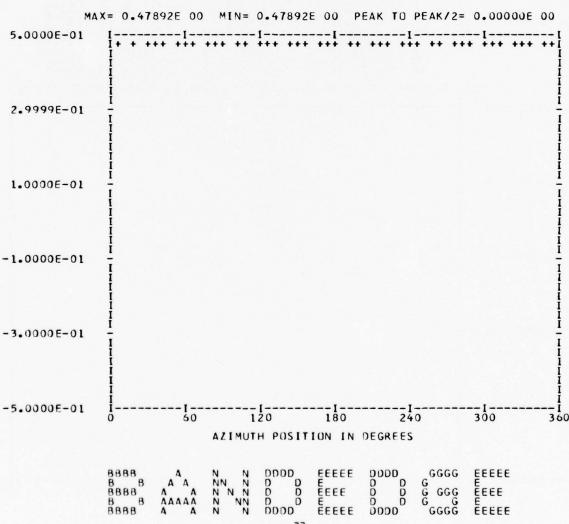


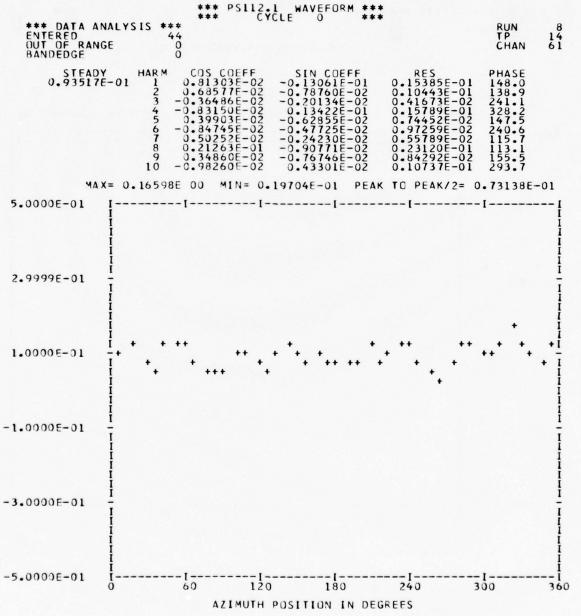


\*\*\* PS107.6 WAVEFORM \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

HARMONIC ANALYSIS SKIPPED

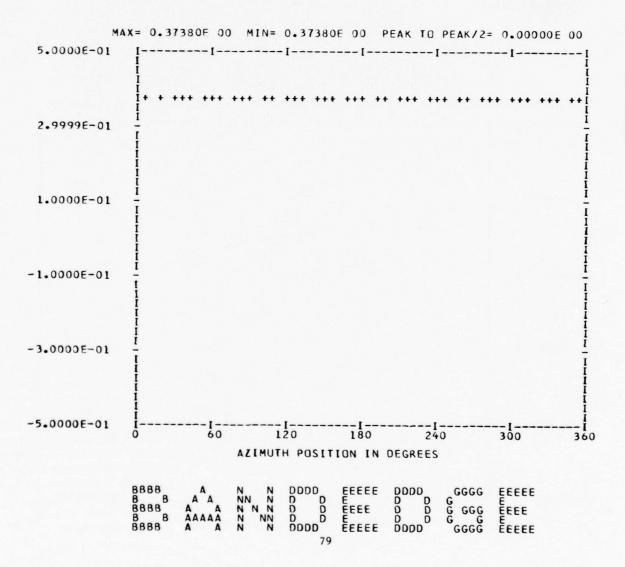


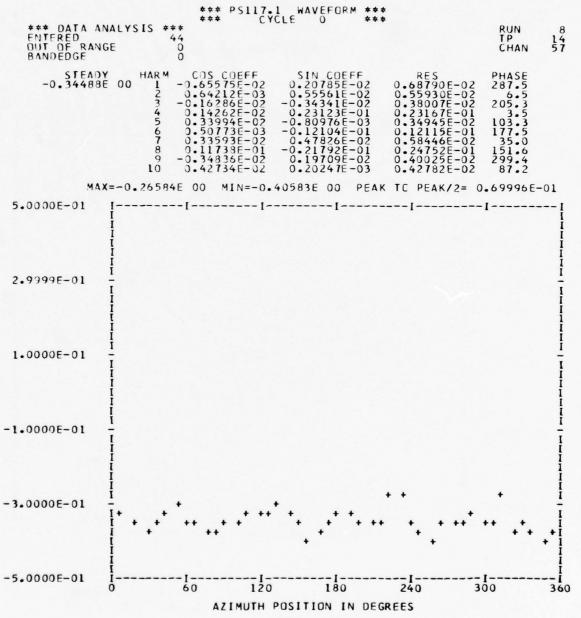


\*\*\* PS112.2 WAVEFORM \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

HARMONIC ANALYSIS SKIPPED

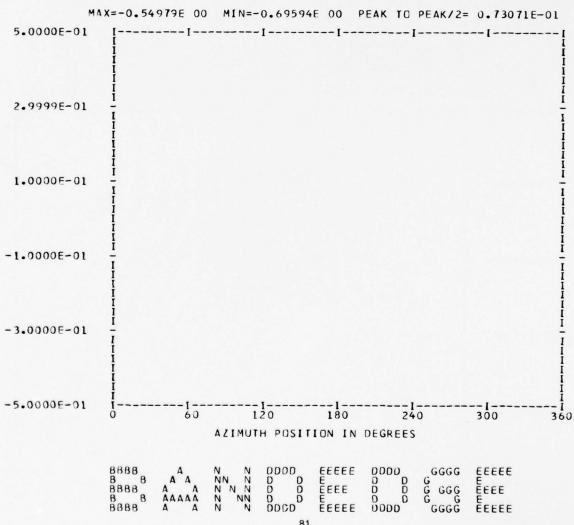




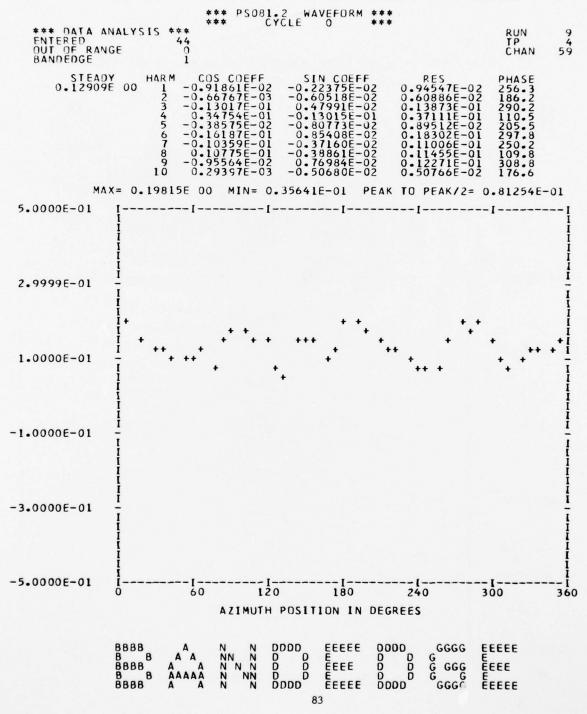
\*\*\* DATA ANALYSIS \*\*\*

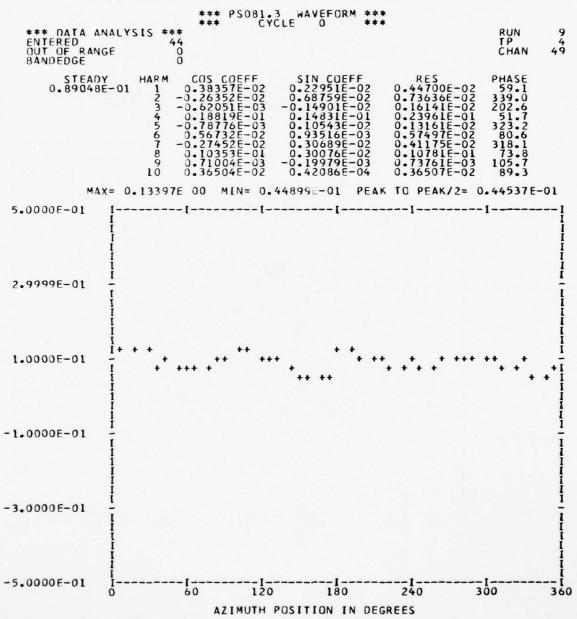
\*\*\* PS117.2 WAVEFORM \*\*\*
\*\*\* CYCLE 0 \*\*\*

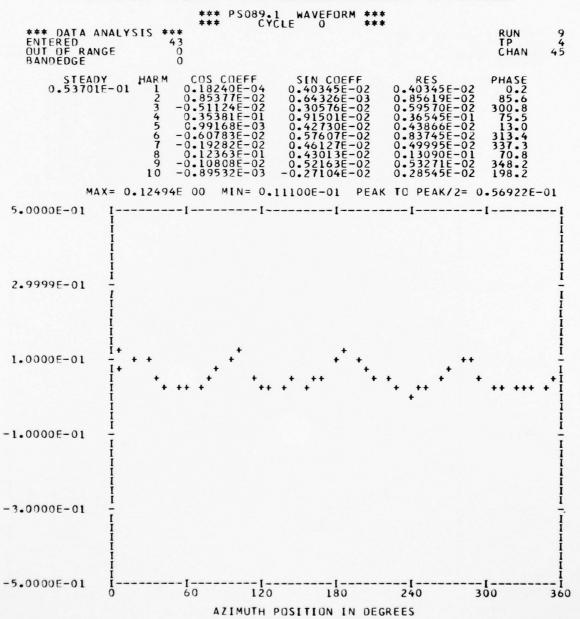
HARMONIC ANALYSIS SKIPPED

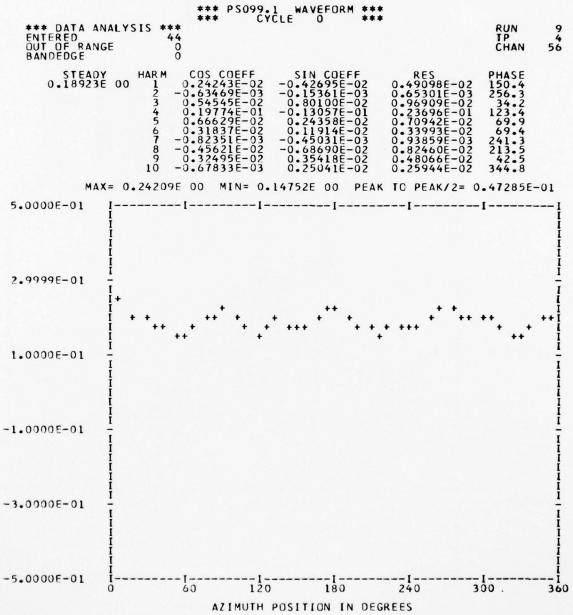


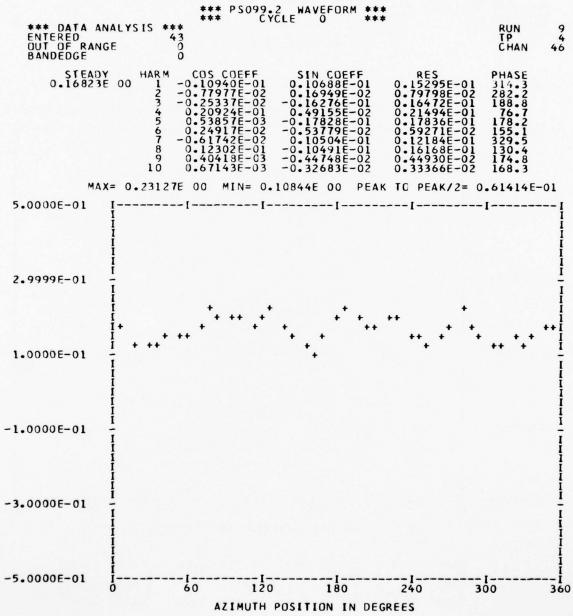
*** PSO81.1 WAVEFORM ***  *** CYCLE 0 ***		
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	9 4 54
STEADY HARM COS COEFF -0.27676E-02 0.48487E-02 0.39812E-02 -0.27676E-02 0.48487E-02 0.34590E-02 -0.25658E-02 0.43068E-02 0.95211E-03 -0.13826E-03 0.96210E-03 0.13684E-01 -0.19740E-01 0.24020E-01 0.20094E-02 0.24921E-02 0.32012E-02 0.30512E-03 0.29222E-02 0.64803E-03 0.29932E-02 0.84159E-02 -0.55922E-02 0.10104E-01 0.17988E-03 0.25022E-03 0.30817E-03	PHASE 235.1 126.5 98.2 145.2 38.8 305.8 177.4 123.6 177.4	
MAX= 0.48247E-01 MIN=-0.26187E-01 PEAK TC PEAK/2= 0.	• 37217E-	-01
2.9999E-01 I		HALLAND HANNE
1.0000E-01	· · · ·	+ 1 + 1
1.0000 = 01		Ī
-3.0000E-01 = I		111111111111111111111111111111111111111
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	00	i 360
AZIMUTH POSITION IN DEGREES		

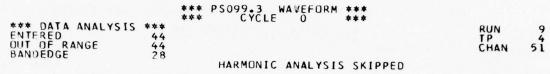


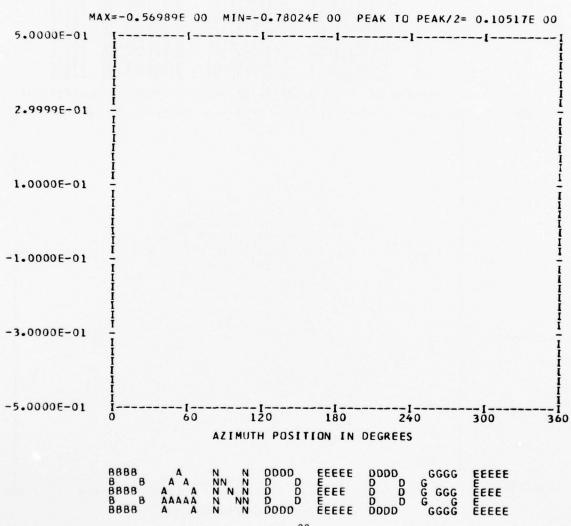


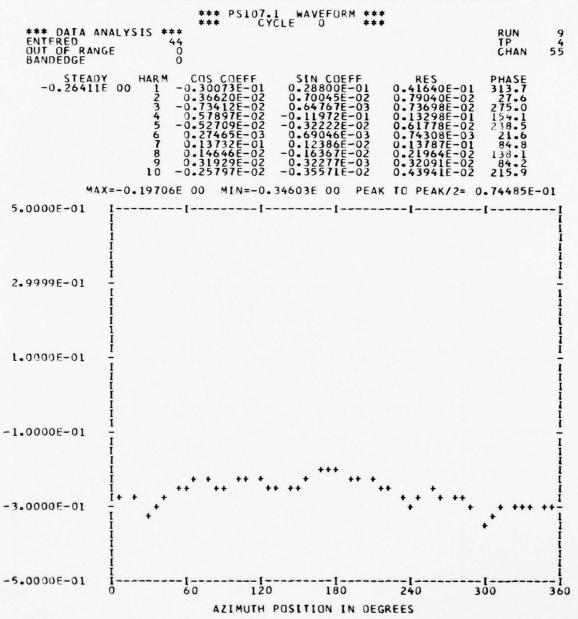


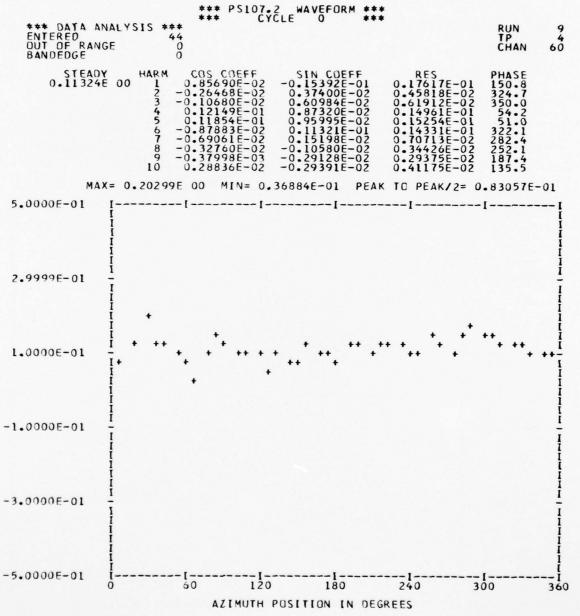


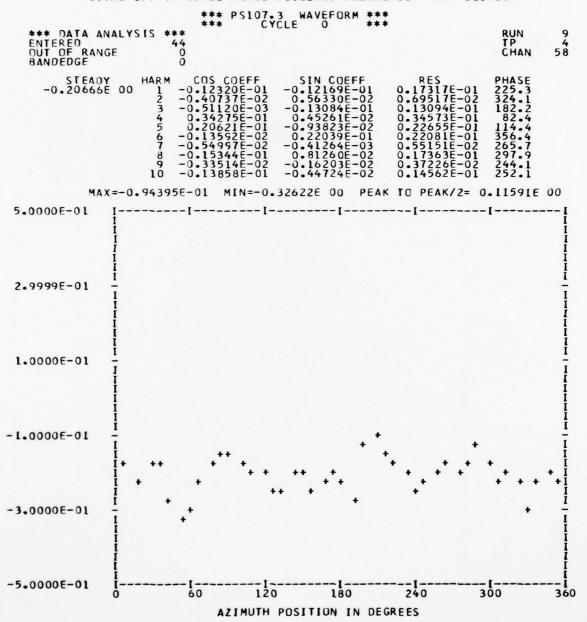


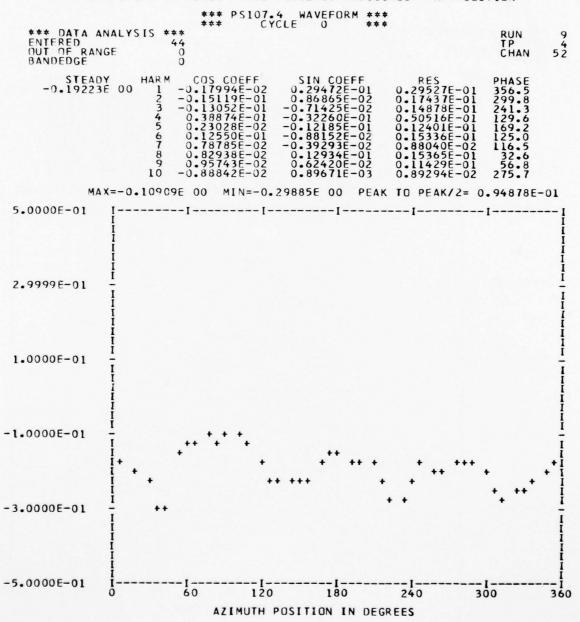


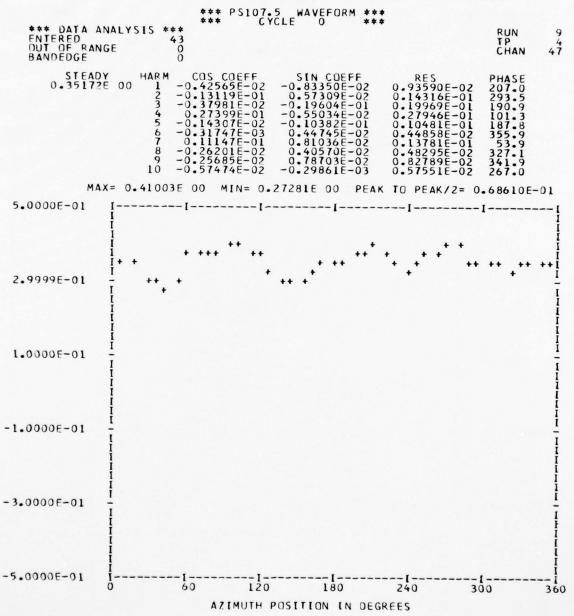












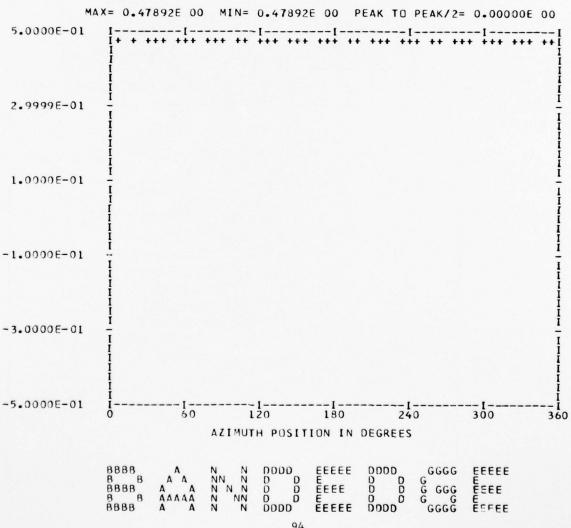
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

\*\*\* PS107.6 WAVEFORM \*\*\*

\*\*\* CYCLE O \*\*\*

RUN 9 TP 4 CHAN 50

HARMONIC ANALYSIS SKIPPED

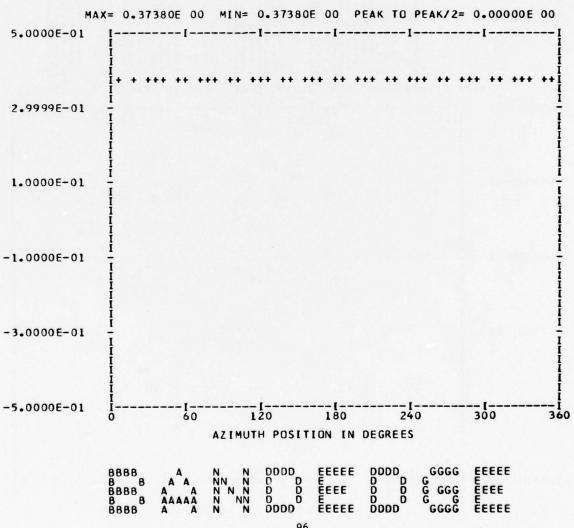


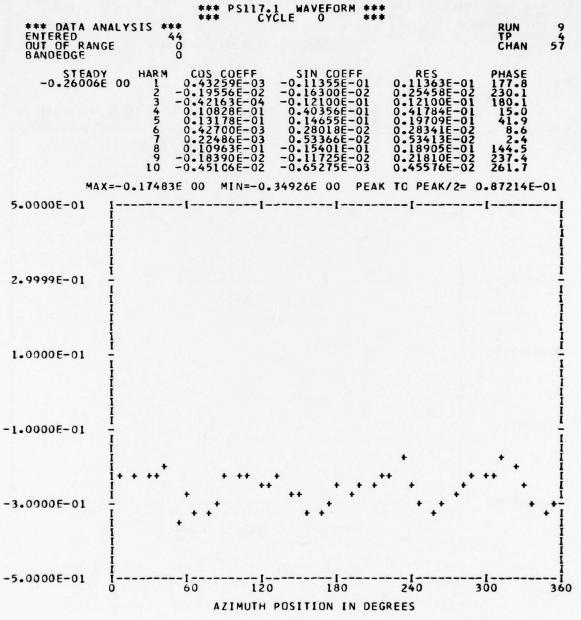
*** PS112.1 WAVEFORM ***  *** CYCLE 0 ***	Dilli	0
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	61
STEADY HARM COS COEFF SIN COEFF 0.20258E-01 0.94177E-01 1 0.14972E-01 -0.13647E-01 0.20258E-01 0.24245E-02 -0.57175E-02 0.62103E-02 0.14416E-01 0.15690E-03 0.14416E-01 0.30877E-01 0.36370E-02 -0.43096E-02 0.56393E-02 0.34522E-02 0.12166E-01 0.24366E-02 0.57677E-02 0.62613E-02 0.72132E-03 0.33833E-02 0.34593E-02 0.34593E-02 0.363631E-02 0.383963E-02 0.81679E-04 0.83963E-02	PHASE 132.3 202.9 269.3 318.7 139.8 286.4 337.9 347.9 335.2 270.5	
MAX= 0.16280E 00 MIN= 0.33048E-01 PEAK TO PEAK/2= 0.	•64876E-0	)1
2.9999E-01	+ + + + +	
-1.0000E-01		HAMMAN   MAN
-3.0000E-01		
-5.0000E-01 IIIIIII	1 00	360
AZIMUTH POSITION IN DEGREES		

BOEING VERTOL CO PHILADELPHIA PA F/G 1/3
INTERACTIONAL AERODYNAMICS OF THE SINGLE ROTOR HELICOPTER CONFI--ETC(U) AD-AU61 360 DAAJ02-77-C-0020 SEP 78 P F SHERIDAN UNCLASSIFIED USARTL-TR-78-23B-VOL-2C NL 2 of 3 AD 61360 im m as i 通用自 mmai W M BL mmoi mmai 中面包 PATE AND ADDRESS OF THE PARTY O MESS **Mani** mani mmai mmni mmai |単単曲| mmai an an an i m d mi - 通婚庙臣 面面動 Timi 面侧面 am mi Maai mmai mmai 限額數法 "inmui "innai mmoi inmai MRAI 21 (0 (0)

\*\*\* PS112.2 WAVEFORM \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 43
OUT OF RANGE 0
BANDEDGE 43
HARMONIC ANALYSIS SKIPPED





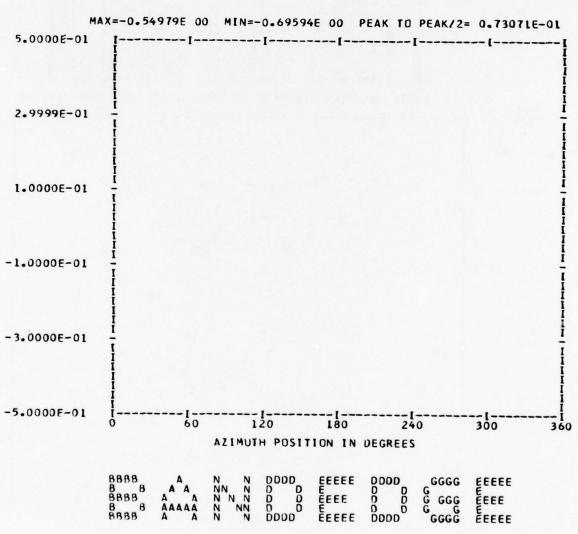
\*\*\* DATA ANALYSIS \*\*\*
ENTERED
OUT OF RANGE 44
BANDEDGE 20

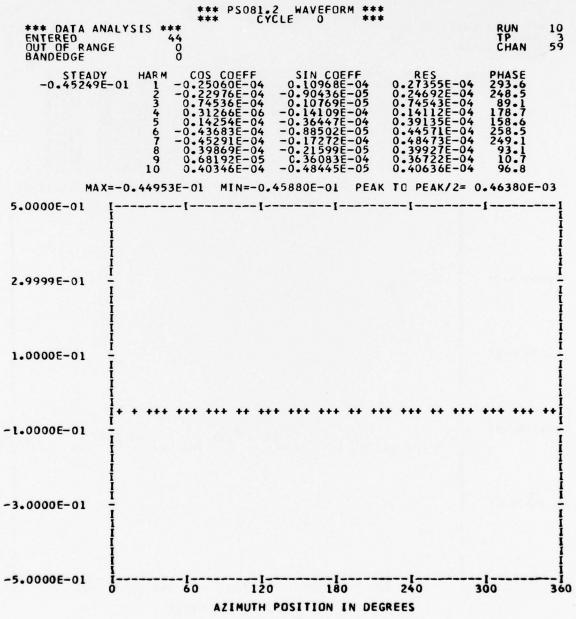
\*\*\* PS117.2 WAVEFORM \*\*\*

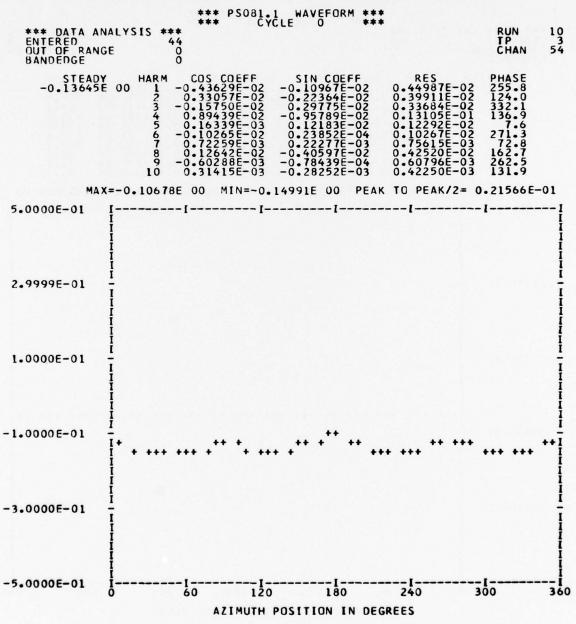
\*\*\* CYCLE 0 \*\*\*

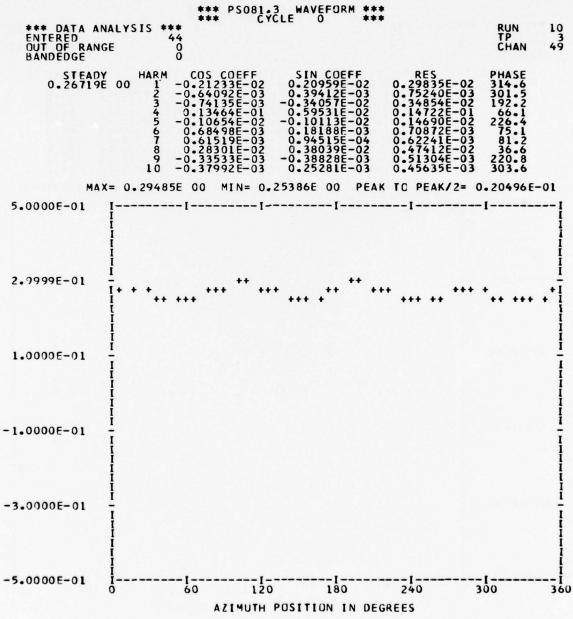
RUN 9 TP 4 CHAN 53

HARMONIC ANALYSIS SKIPPED

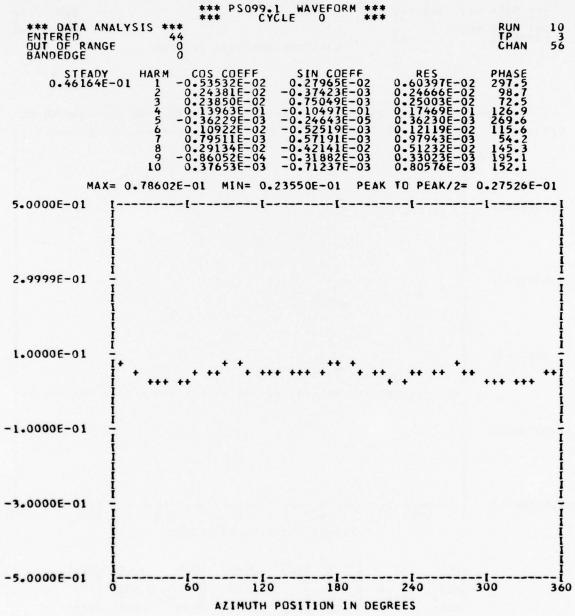








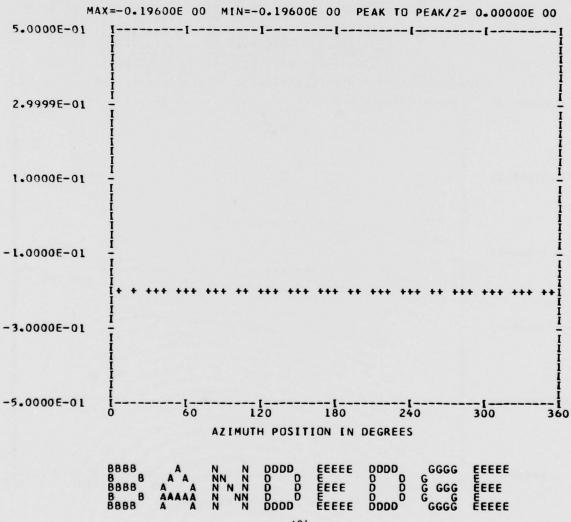
*** PS089-1 WAVFFORM ***					
*** DATA AN ENTERED OUT OF RANG BANDEDGE	*** PS089.1 WAVEFORM ***  IALYSIS ***  6E 0 0	RUN TP CHAN	10 3 45		
STEADY 0.21068E	2	PHASE 231.4 106.5 276.5 225.7 99.0 298.1 93.5 192.0 84.1			
MAX 5.0000E-01	= 0.70135E-01 MIN= 0.13875E-02 PEAK TO PEAK/2= 0	.34373E-	-01		
2.9999E-01					
1.0000E-01	<u> </u>	*** ***	1 1 1 ++1 1		
-1.0000E-01			1 1 1 1 1 1 1 1		
-3.0000E-01	[	.[]	I I I I I		
	0 60 120 180 240 3 AZIMUTH POSITION IN DEGREES	00	360		



\*\*\* PS099.2 WAVEFORM \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0 CHAN 46
BANDEDGE 44

HARMONIC ANALYSIS SKIPPED



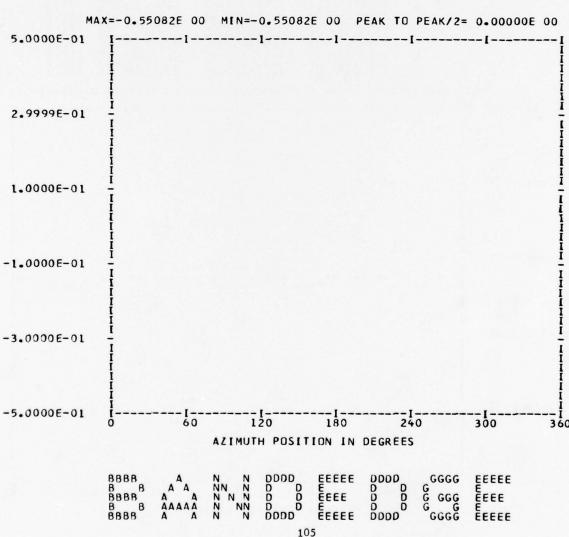
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 44
BANDEDGE 44

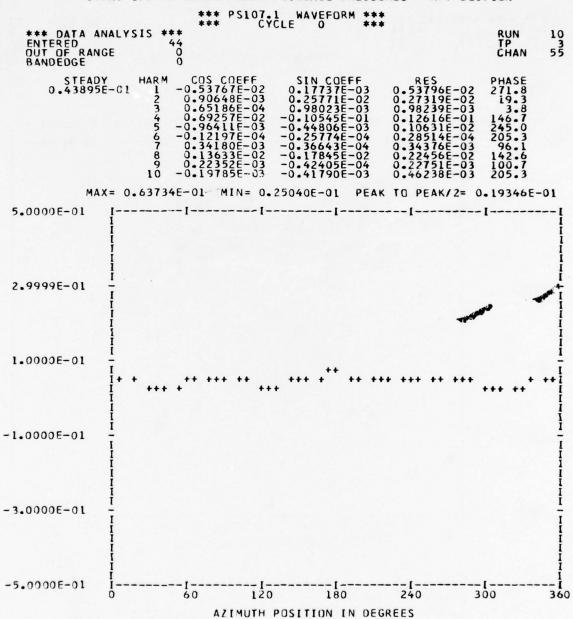
\*\*\* PS099.3 WAVEFORM \*\*\*

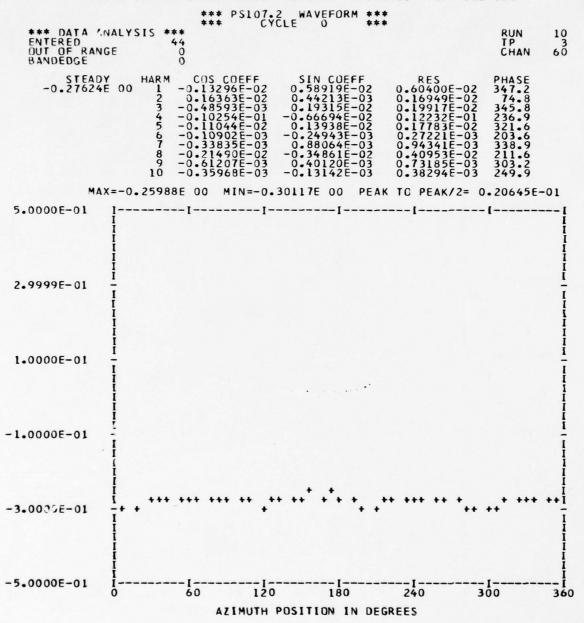
\*\*\* CYCLE 0 \*\*\*

RUN 10 TP 3 CHAN 51

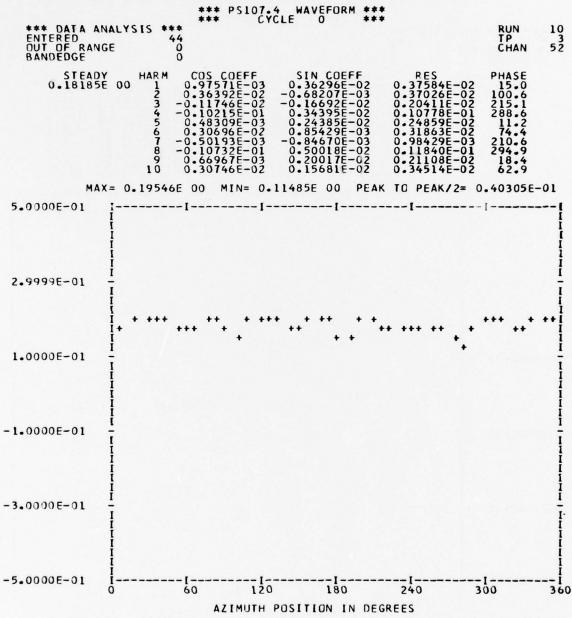
HARMONIC ANALYSIS SKIPPED

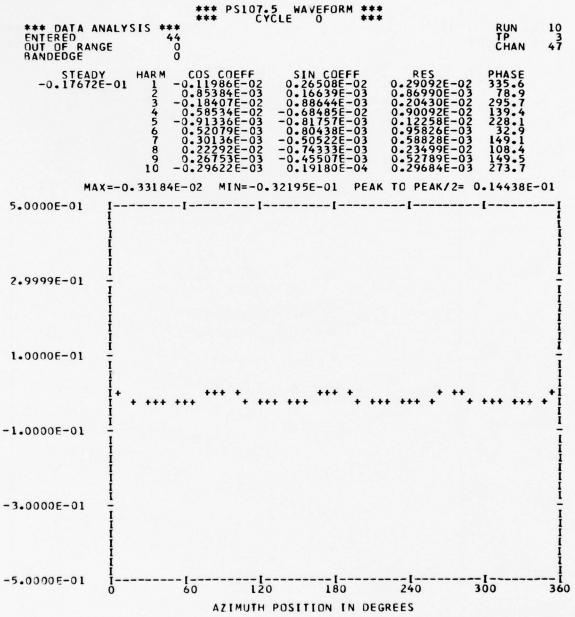






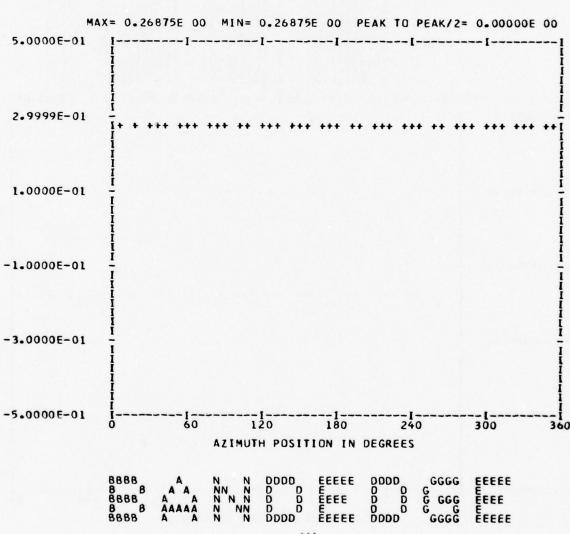
*** DATA ANAL ENTERED OUT OF RANGE	YSIS *** 44	** PS107.3 ** CYC	WAVEFORM *** LE 0 ***		RUN TP	10
OUT OF RANGE BANDEDGE	0				CHAN	58
STEADY -0.97405E-0	2 0.5 3 -0.1 4 -0.2 5 0.3 6 0.3 7 -0.1	S COEFF 6413E-03 9278E-02 9684E-02 1371E-01 2886E-03 4718E-02 0515E-01 22C9E-02 8386E-02	SIN COEFF 0.53449E-02 -0.14239E-02 -0.18353E-02 0.32897E-02 0.34642E-02 -0.24907E-03 -0.25333E-03 0.12538E-01 0.25166E-02 0.54399E-04	RES 0.53573E-02 0.60964E-02 0.26913E-02 0.21623E-01 0.34798E-02 0.34807E-02 0.14712E-02 0.16364E-01 0.27971E-02 0.38390E-02	PHASE 3.8 103.5 227.0 278.7 5.4 94.1 260.0 320.0 25.8 89.1	
	0.76747E-01	MIN=-0.	18345E 00 PEAK	TO PEAK/2= 0	•53355E-	01
5.0000E-01 I-	I	I	[	1	I	!
2.9999E-01						
1.0000E-01						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-1.0000E-01	+ ++*	**	+ + ++	· · · · · · · · · · · · · · · · · · ·	•••	++1 I I I I
-3.0000E-01						I I I I I I
-5.0000E-01 i-	I	120	180		00	i 360
		ALIMUTH P	OSITION IN DEGI	KEE2		

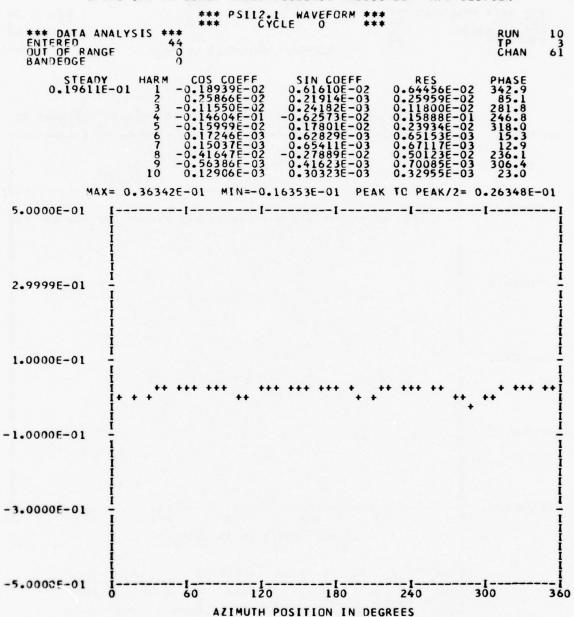




\*\*\* PS107.6 WAVEFORM \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44
HARMONIC ANALYSIS SKIPPED

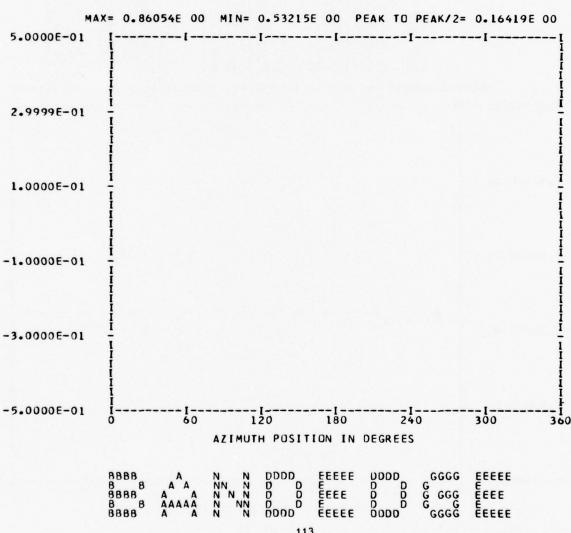


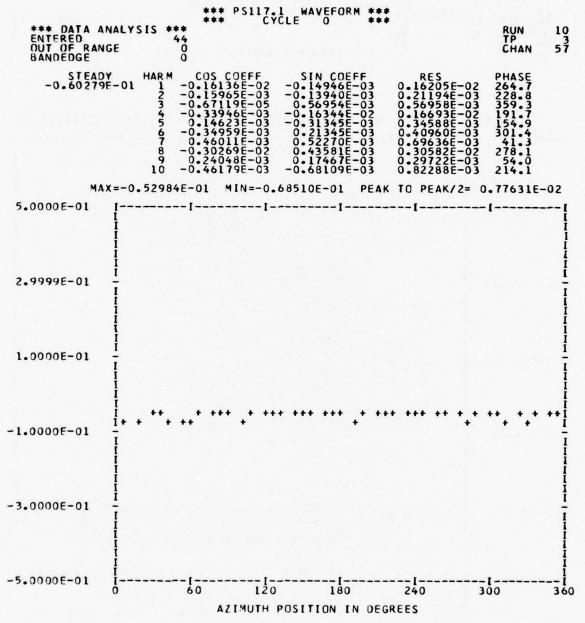


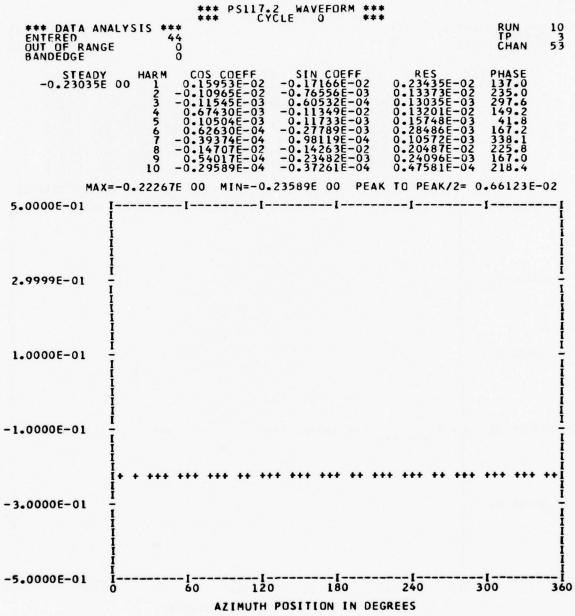
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 44
BANDEDGE 44

\*\*\* PS112.2 WAVEFORM \*\*\*
\*\*\* CYCLE 0 \*\*\*

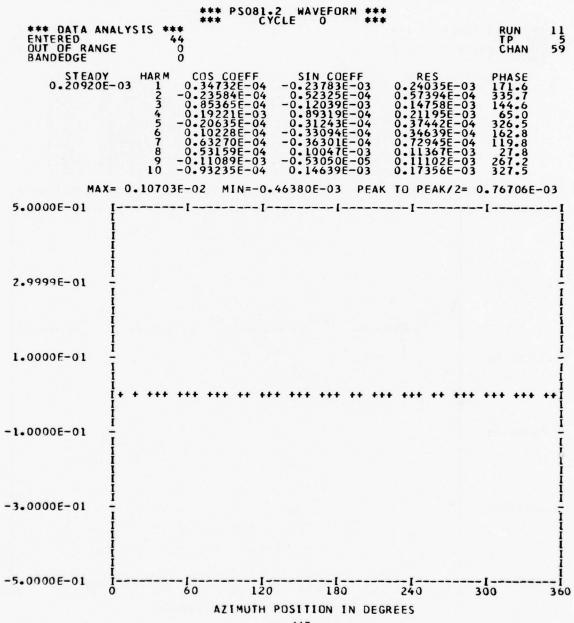
HARMONIC ANALYSIS SKIPPED

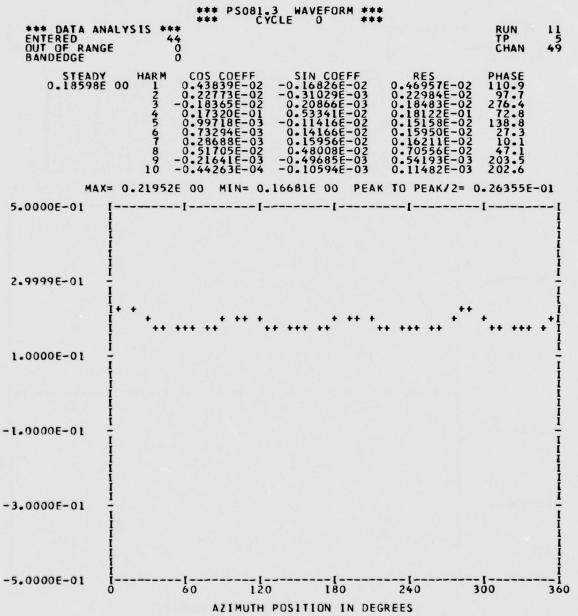


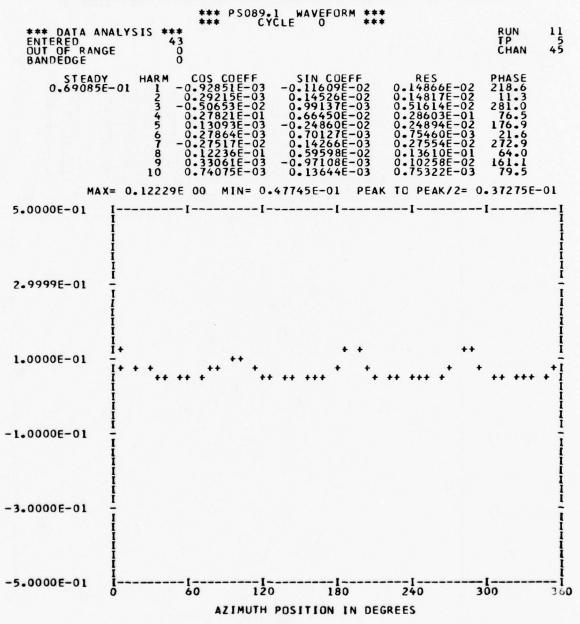


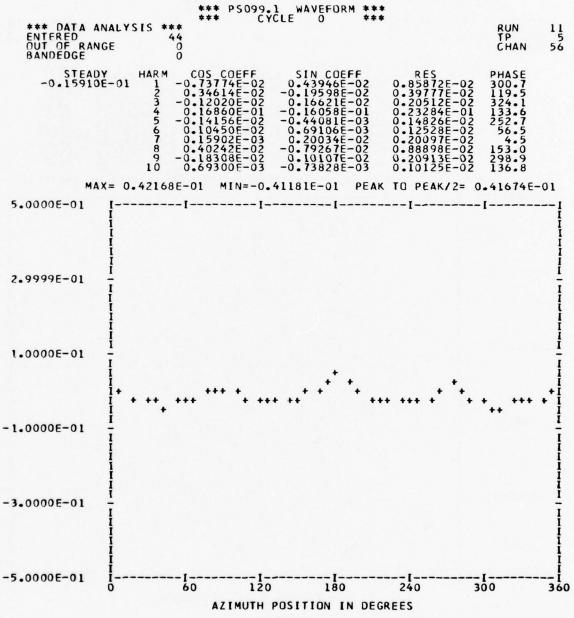


*** PS081.1 WAVEFORM ***  *** CYCLE 0 ***		
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	11 5 54
STEADY HARM COS COEFF SIN COEFF 0.14523E-01 2 0.26938E-02 -0.12665E-02 0.29767E-02 3 0.40861E-03 -0.50098E-03 0.64648E-03 4 0.91756E-02 -0.10757E-01 0.14139E-01 5 -0.18330E-02 0.69264E-05 0.18330E-02 6 0.10288E-02 -0.20035E-07 0.10288E-02 7 0.49555E-03 0.53151E-03 0.72668E-03 8 0.61059E-03 -0.58194E-02 0.58514E-02 9 -0.52473E-03 0.22982E-02 0.23573E-02 10 0.55978E-03 0.71659E-04 0.56435E-03	PHASE 239.3 115.1 140.7 139.5 270.2 90.0 42.9 174.0 347.1 82.7	
MAX=-0.54963E-01 MIN=-0.12360E 00 PEAK TC PEAK/2= 0.	34321E-	01
2.9999E-01		I I I I I I I I I
1.0000E-01		- - - - - - - - - - - - - - - - - -
-1.0000E-01	** ***	+
-3.0000E-01		
-5.0000E-01	0	i 360
AZIMUTH POSITION IN DEGREES		







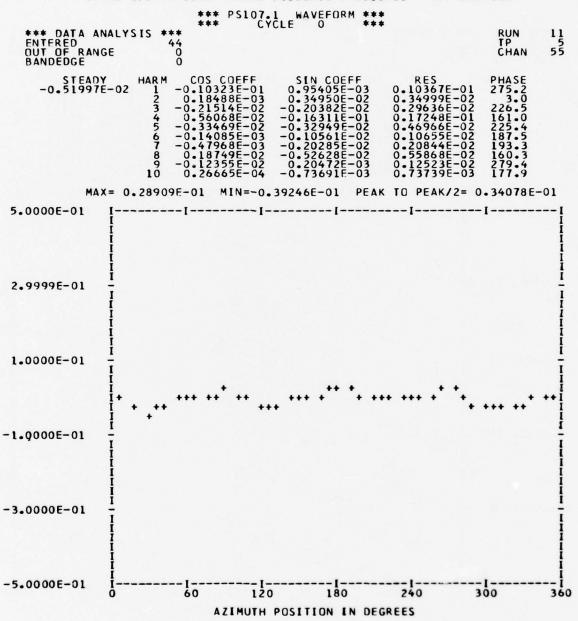


*** PS099.2 WAVEFORM ***  *** DATA ANALYSIS *** ENTERED 43	RUN TP	11
OUT OF RANGE O BANDEDGE O	CHAN	46
STEADY HARM COS COEFF SIN COEFF 0.17962E-02 0.10901E 00 1 -0.32536E-03 -0.17664E-02 0.17962E-02 2 -0.18134E-02 0.49913E-03 0.18808E-02 3 -0.26008E-02 -0.18670E-03 0.26075E-02 4 0.21208E-01 0.41577E-02 0.21612E-01 5 -0.53110E-03 -0.28930E-02 0.29413E-02 6 0.97753E-03 0.50370E-03 0.10996E-02 7 -0.20445E-02 0.11333E-02 0.23376E-02 8 0.99201E-02 0.25658E-02 0.93780E-02 9 -0.18173E-03 -0.14849E-02 0.14960E-02 10 0.88444E-03 -0.50060E-04 0.88586E-03	PHASE 190.4 285.3 265.8 78.9 190.4 62.7 298.9 74.1 186.9 93.2	
MAX= 0.15341E 00 MIN= 0.88494E-01 PEAK TO PEAK/2= 0.		-01
5.0000E-01		I I I I I I I I I
1.0000E-01	** ***	
-1.0000E-01		<u> </u>
-3.0000E-01		
-5.0000E-01 IIIIII	00	360
AZIMUTH POSITION IN DEGREES 121		
121		

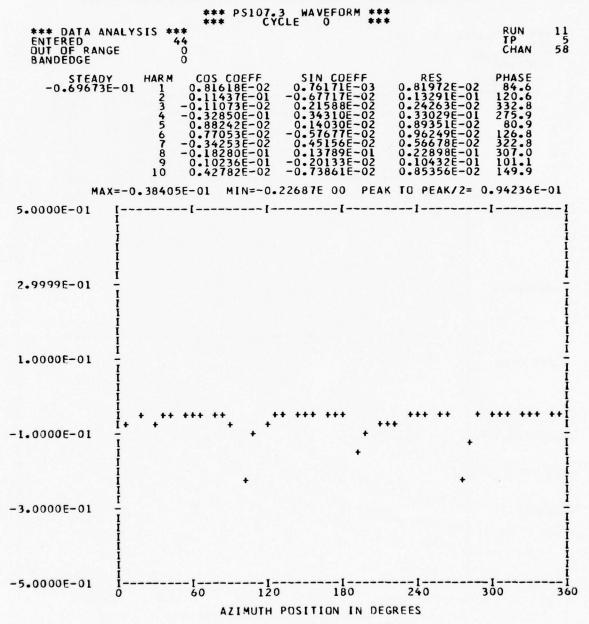
\*\*\* PS099.3 WAVEFORM \*\*\*

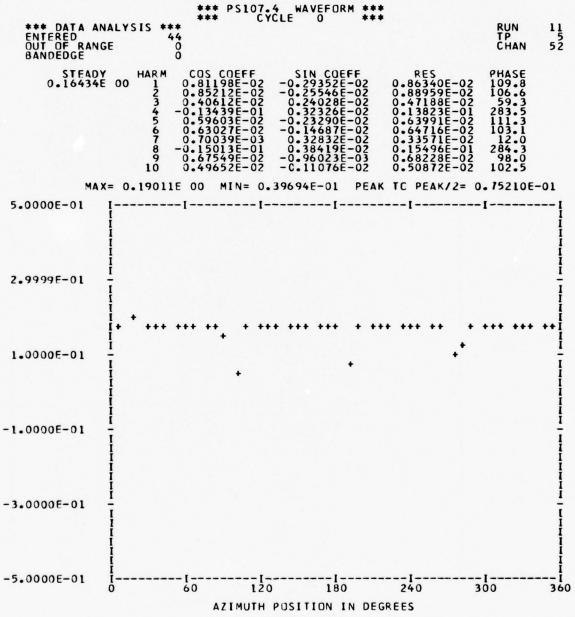
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0 BANDEDGE 44

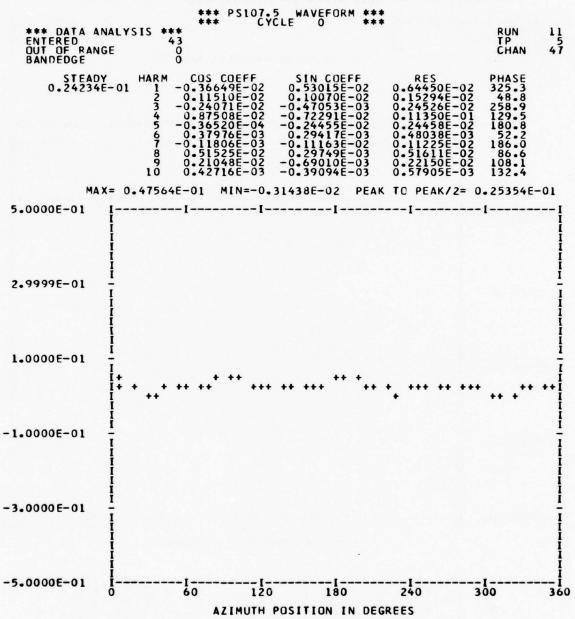
HARMONIC ANALYSIS SKIPPED



		** PS107.2	WAVEFORM *** LE 0 ***			
*** DATA ANAL ENTERED OUT OF RANGE BANDEDGE	YSIS *** 44 0 0				RUN TP CHAN	11 60
STEADY -0.11266E 0	0 1 0.1 2 0.2 3 -0.5 4 -0.1 5 -0.2 6 -0.1 7 -0.2 8 -0.2 9 -0.1	2048E-02 7689E-03 0984E-02 9038E-02 1882E-03 5920E-03	SIN COEFF 0.14677E-01 0.81711E-03 0.44018E-02 -0.65937E-02 0.24753E-02 -0.27081E-03 0.93466E-03 -0.43240E-02 0.15668E-02 -0.10834E-02	RES 0.14748E-01 0.25663E-02 0.71099E-02 0.17653E-01 0.33149E-02 0.32347E-03 0.22972E-02 0.52086E-02 0.15713E-02 0.12682E-02	PHASE 5.6 71.4 308.2 248.0 318.3 213.1 294.0 213.8 355.6 148.6	
MAX=- 5.0000E-01 I-	0.80006E-01		4780E 00 PEAK	TO PEAK/2= 0	.33901E-0	1
2.9999E-01		<b>!</b>				
1.0000E-01 - I						
-1.0000E-01		*** ** ***	*** *** ** **	· ••• •• • •• ·	·* *** *	1111 +- 1111.
-3.0000E-01						
-5.0000E-01 I	I 00		L80 DSITION IN DEGR		00	i i - i 360

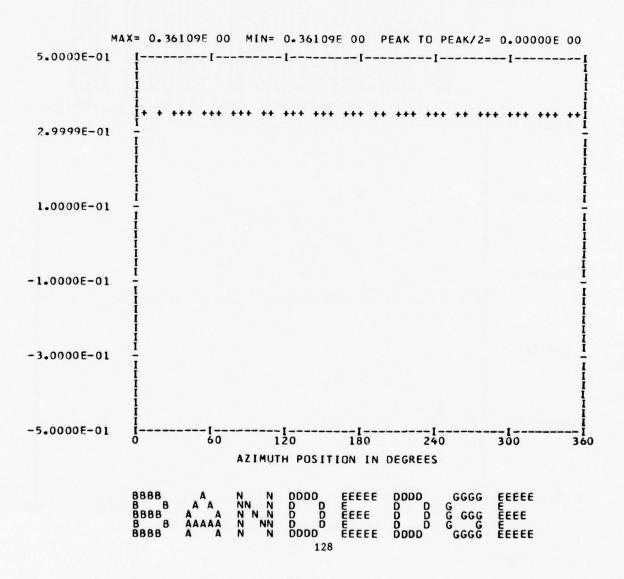






\*\*\* PS107.6 WAVEFORM \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44
HARMONIC ANALYSIS SKIPPED



0117	13 1/5 11	*** PS112.	1 WAVEFORM **		. TON	
*** DATA ANA ENTERED OUT OF RANGE BANDEDGE		*** PS112. *** CY ***	CLE 0 **		RUN TP CHAN	11 5 61
STEADY -0.97713E-	HARM 1 2 3 4 5 6 7 8 9 10	COS COEFF 0.15135E-02 0.27583E-02 -0.74790E-02 -0.22367E-01 -0.33874E-02 -0.11237E-02 -0.48754E-02 -0.15655E-02 -0.10897E-02	SIN COEFF 0.12354E-01 0.11007E-03 0.29792E-02 -0.55858E-02 0.33496E-02 -0.12183E-02 -0.20646E-02 -0.48430E-02 0.11245E-02 -0.16007E-02	RES 0.12447E-01 0.27605E-02 0.80506E-02 0.23054E-01 0.47639E-02 0.16574E-02 0.34163E-02 0.68720E-02 0.19276E-02 0.19364E-02	PHASE 6.97 87.7 291.7 295.9 314.6 317.3 232.8 225.1 305.6 214.2	
	=-0.6280	3E-01 MIN=-0.	14815E 00 PEA	K TC PEAK/2= (	.42673E-	-01
5.0000E-01 2.9999E-01		I I-	[	[	- [	I I I I I
1.0000E-01						I I I I I I I
-1.0000E-01	 	*** *** ** **	· *** ** <sub>* *</sub> .	** *** **	.** ***	+
-3.0000E-01 -	I I I I I I					I
-5.0000E-01	i i	1- 60 120 AZIMUTH	180 POSITION IN DE		- [	i 360

\*\*\* PS112.2 WAVEFORM \*\*\*

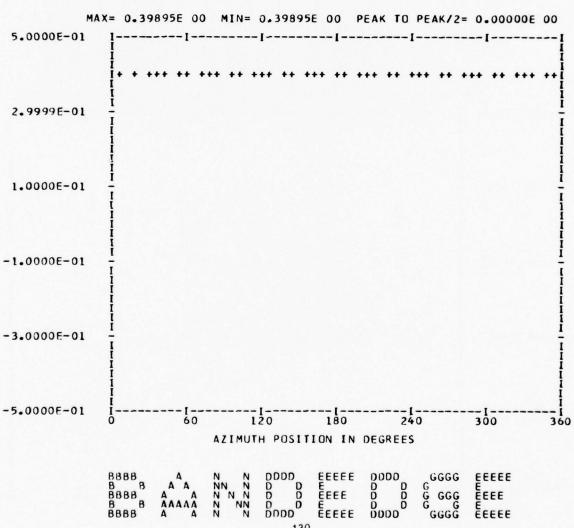
\*\*\* DATA ANALYSIS \*\*\*
ENTERED
OUT OF RANGE
OBANDEDGE

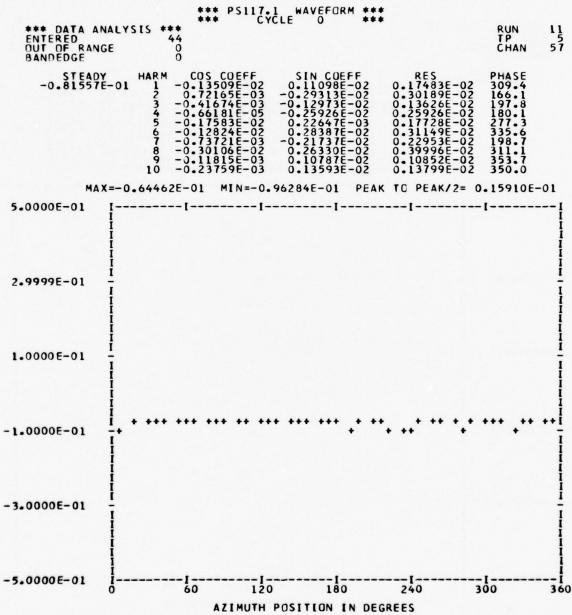
\*\*\* PS112.2 WAVEFORM \*\*\*

CYCLE
O
\*\*\*

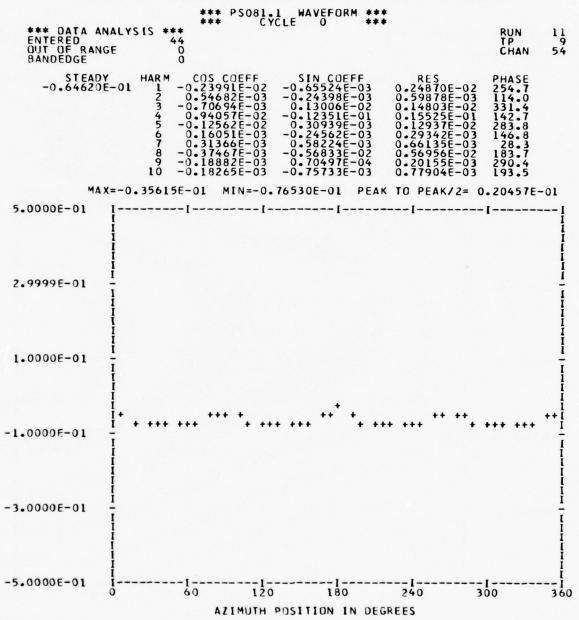
TP 5 CHAN 48

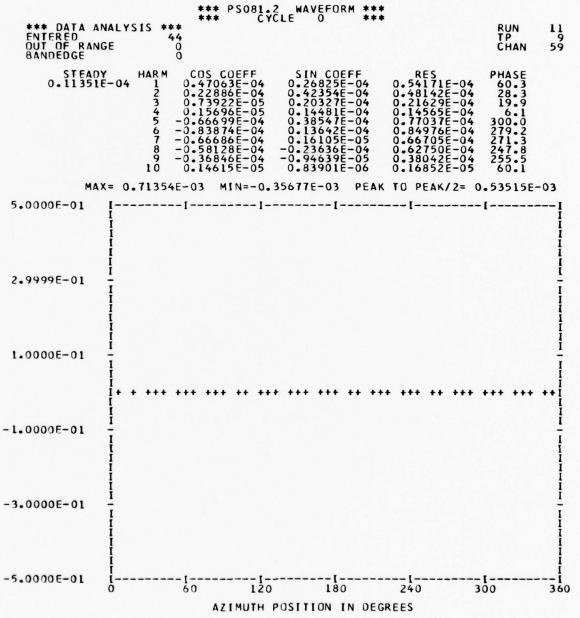
HARMONIC ANALYSIS SKIPPED

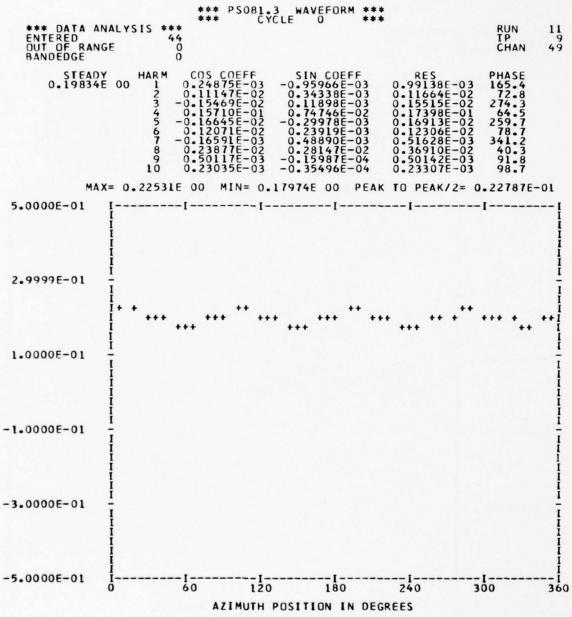


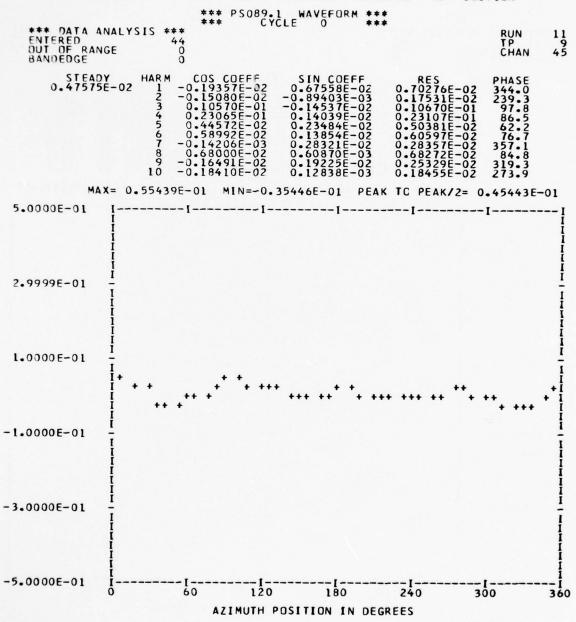


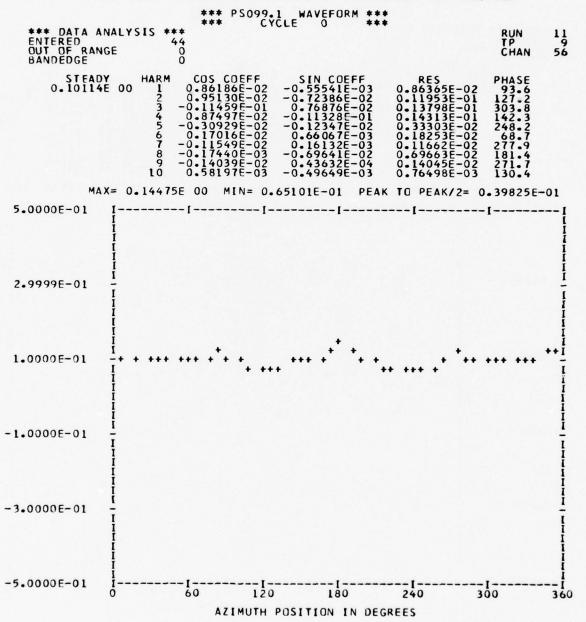
*** PS117.2 WAVEFORM ***  *** CYCLE 0 ***	0.111	
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 44 BANDEDGE 0	RUN TP CHAN	11 5 53
STEADY HARM COS COEFF 0.80287E-03 0.10779E-02 0.2059789E 00 1 0.71929E-03 0.80287E-03 0.10779E-02 0.16458E-03 0.15592E-03 -0.57657E-03 0.58811E-03 0.24271E-02 0.26042E-02 0.26042E-02 0.41124E-03 0.37838E-03 0.55883E-03 0.41124E-03 0.37838E-03 0.55883E-03 0.10799E-02 -0.16394E-02 0.19631E-02 0.10799E-02 -0.16394E-02 0.19631E-02 0.38564E-03 0.37584E-03 0.47414E-03	PHASE 41.8 289.1 168.6 158.7 245.8 472.3 172.2 204.9 54.4	
MAX=-0.54979E 00 MIN=-0.60343E 00 PEAK TC PEAK/2= 0	.26818E-	01
5.0000E-01 [[[[	1	[
		i
2.9999E-01		I I I I I
1.0000E-01		I I I I
-1.0000E-01		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-3.0000E-01		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	1 00	i 360
AZIMUTH POSITION IN DEGREES		

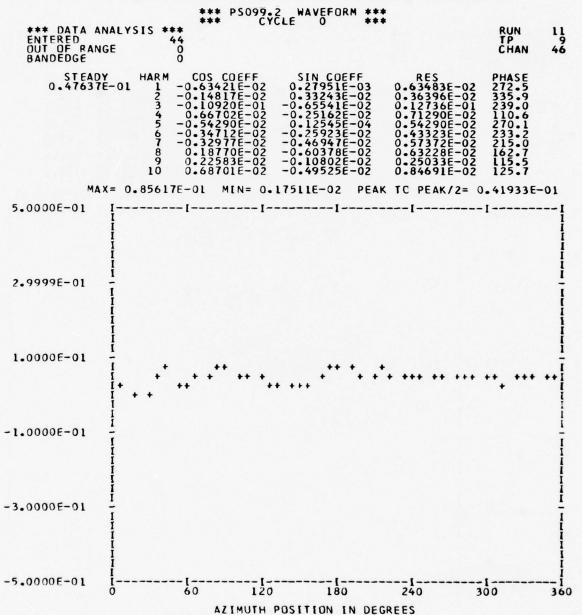




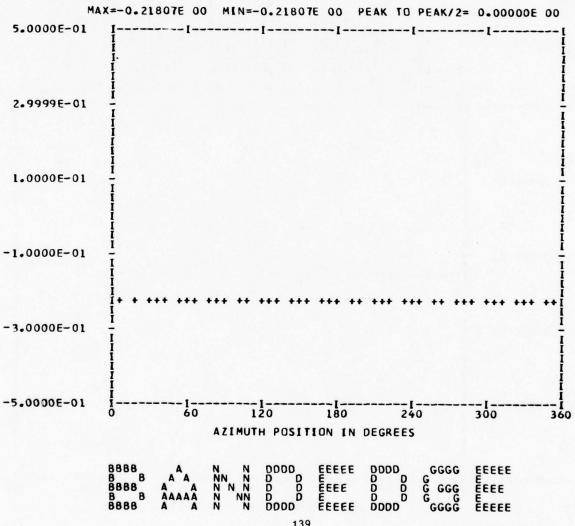




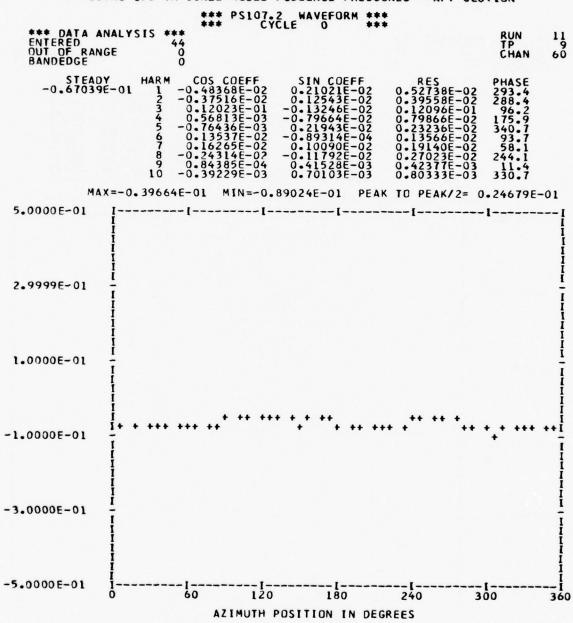




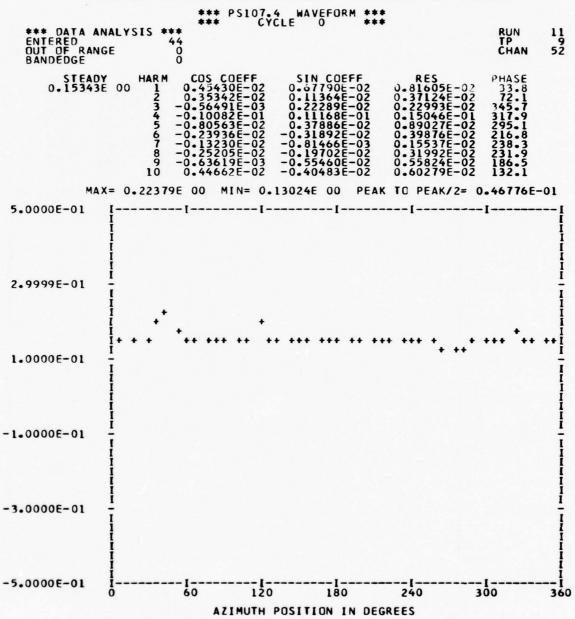
HARMONIC ANALYSIS SKIPPED

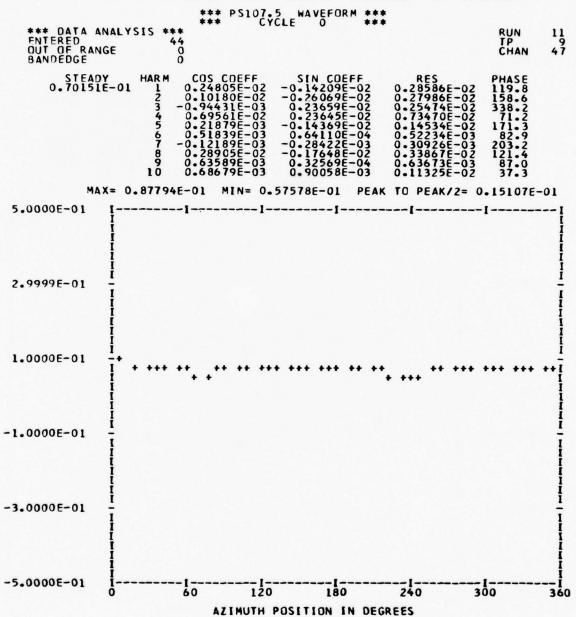


*** DATA ANA Entered		*** C	·1 WAVEFORM ** YCLE 0 **	:	RUN TP	11
OUT OF RANGE		0			CHAN	55
STEADY 0.59854E-	HARM	COS COEFF -0-19810E-02 -0-13251E-01 -0-22140E-02 -0-65022E-03 -0-21623E-02 -0-64391E-03 -0-80448E-03 -0-87300E-04	SIN COEFF -0.66042E-02 -0.65126E-02 -0.48867E-02 -0.45146E-02 -0.24976E-02 -0.23776E-02 -0.12560E-02 -0.26005E-02 -0.32332E-03 -0.12387E-02	RES 0.68950E-02 0.11820E-01 0.14124E-01 0.50283E-02 0.25808E-02 0.32138E-02 0.14115E-02 0.27221E-02 0.50948E-03 0.12418E-02	PHASE 196.6 123.4 249.7 153.8 1222.2 207.1 230.6 184.0	
	0.9015			K TO PEAK/2= 0	.26726E-	-01
5.0000E-01 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		[]			1	
1.0000E-01		*** *** ** *	· ··· ·· ·· ·· ·· ·	·· ··· ·· ···	*** ***	1 1 1 1 1 ++I
-1.0000E-01 I						I I I I I
-3.0000E-01 I						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-5.0000E-01 I		[]- 60 12 AZIMUTH	POSITION IN DE		1	-1 1 360
			140			



0111	AS 1/5 1	H SCALE MUDEL	FUSELAGE PR	NESSUKESAFT	SECTION	
		*** PS107.	3 WAVEFORM	1 ***		
*** DATA AN ENTERED OUT OF RANG BANDEDGE		** 44 0 0			RUN TP CHAN	11 9 58
STEADY -0.65443E-	HARM 1 2 3 4 5 6 7 8 9	COS COEFF -0.16758E-02 0.52440E-03 -0.20104E-03 -0.45564E-02 -0.19965E-02 0.79295E-03 -0.59641E-03 -0.32675E-03 0.45784E-04	SIN COEF 0.25445E- 0.66714E- -0.95763E- 0.11124E- 0.19145E- 0.10046E- -0.11735E- 0.10279E- -0.67887E-	-02 0.30467E- -03 0.52862E- -02 0.63640E- -02 0.22855E- -03 0.81573E- -02 0.13164E- -03 0.34254E-	-02 82.7 -03 191.8 -02 225.8 -02 299.1 -03 76.4 -02 336.4 -02 206.9 -03 287.4	
MAX	=-0.5053	0E-01 MIN=-0.	83032E-01	PEAK TO PEAK	2= 0.16251E	-01
5.0000E-01	[	[[-	[	·I	1	I
2•9999E-01 -						111111
1.0000E-01	I I					İ
-1.0000E-01	I I I I I I I I I I I I I I I I I I I	*** *** **		· ••• •••	··· ··· ·	++++
-5.0000E-01	i	!!-		<u>-</u> I	1	
	0	60 120		240	300	360
		AZIMUTH	POSITION IN	DEGREES		

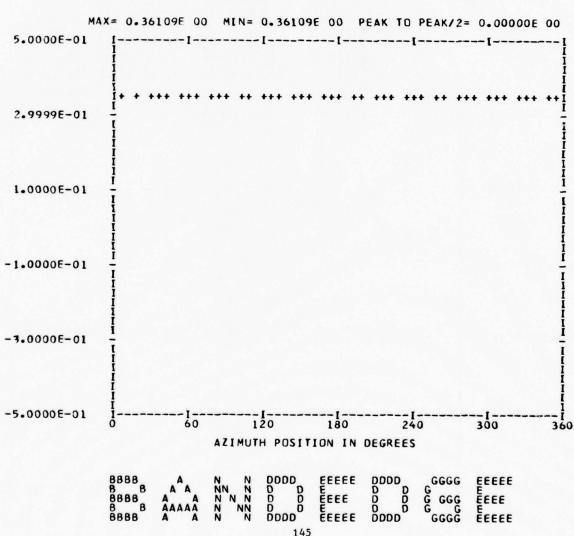


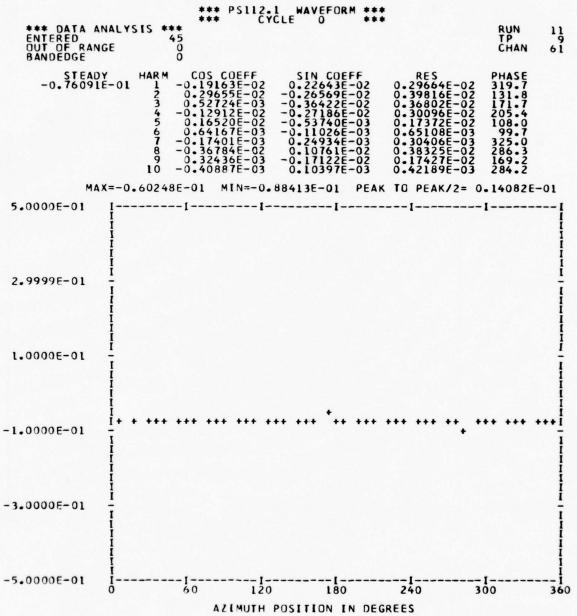


\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

\*\*\* PS107.6 WAVEFORM \*\*\*
CYCLE 0 \*\*\*

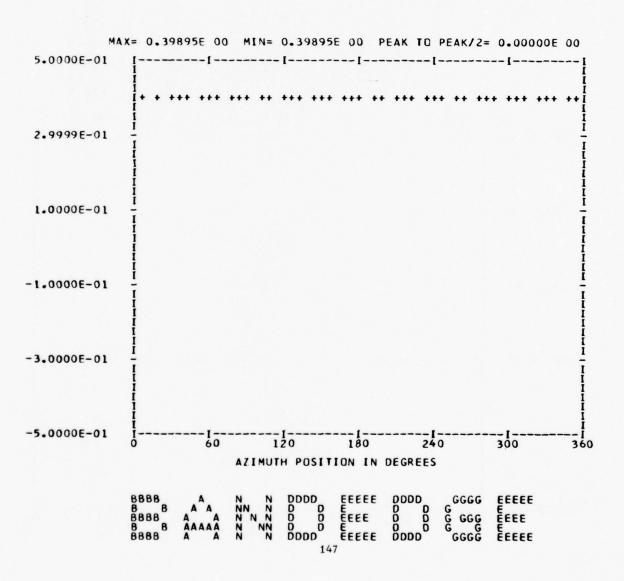
HARMONIC ANALYSIS SKIPPED



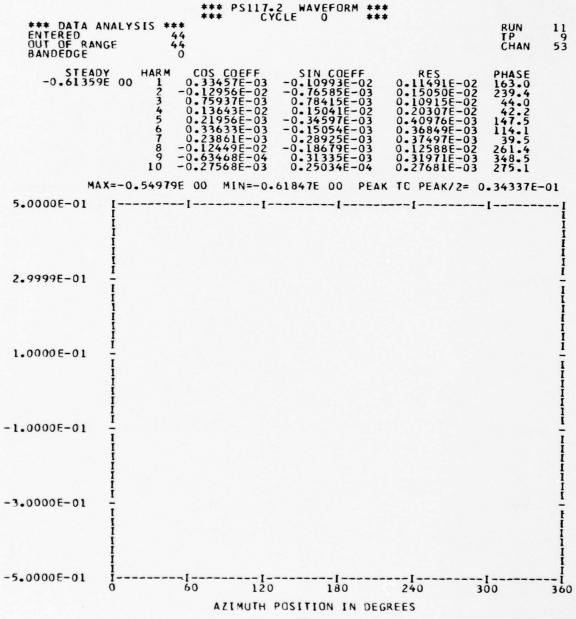


\*\*\* PS112.2 WAVEFORM \*\*\*

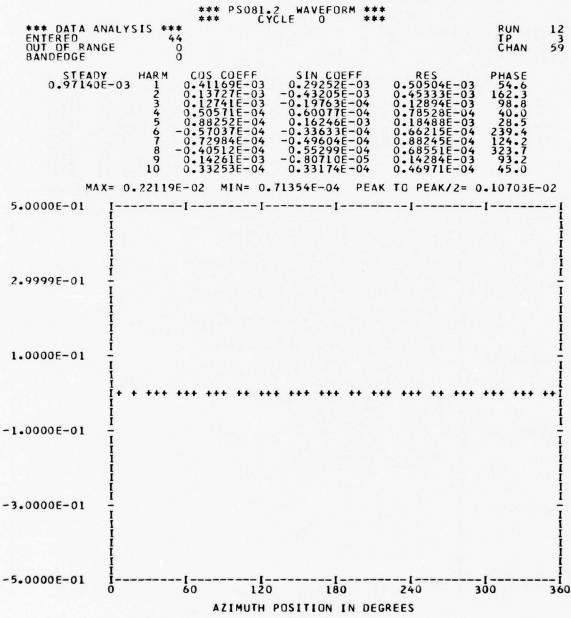
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44
HARMONIC ANALYSIS SKIPPED

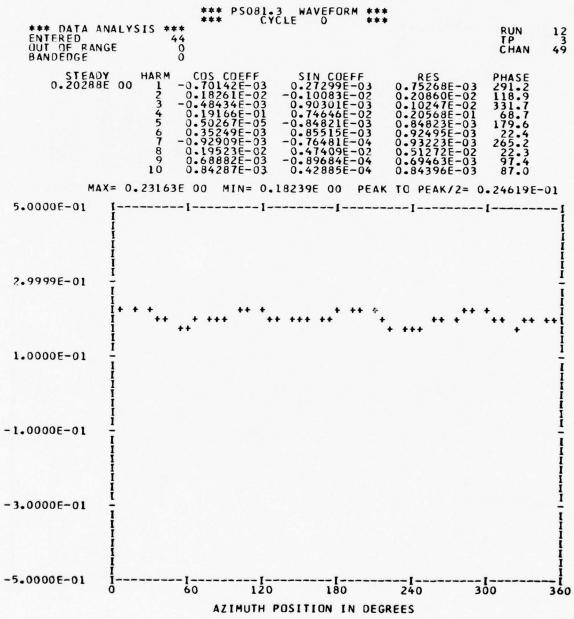


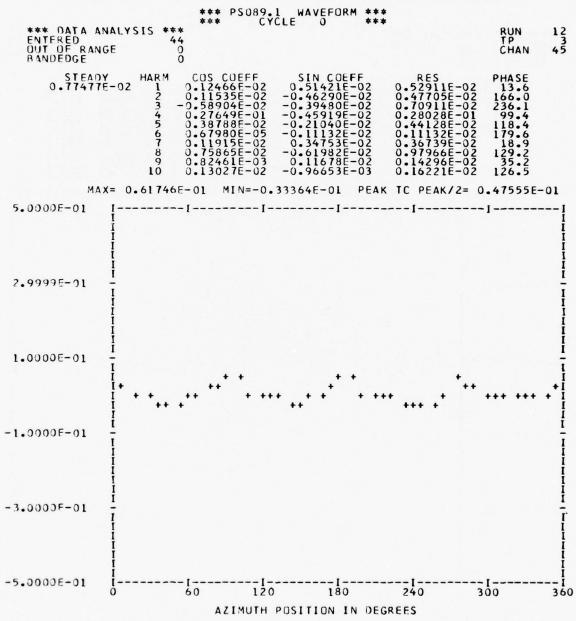
OTTAS 173 TH SCALL MODEL POSELAGE PRESSURESAFT SECTION	
*** PS117.1 WAVEFORM ***  *** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	11 9 57
STEADY HARM COS COEFF SIN COEFF 0.31575E-02 252.5  1 -0.30129E-02 -0.94460E-03 0.31575E-02 252.5  2 -0.29720E-02 -0.93782E-03 0.31165E-02 252.4  3 0.73224E-03 0.10076E-02 0.12456E-02 36.0  4 0.45524E-02 0.44124E-02 0.63399E-02 45.8  5 -0.50590E-04 -0.67254E-03 0.67444E-03 184.3  6 0.58378E-04 -0.67313E-03 0.67566E-03 175.0  7 0.14306E-03 0.57162E-03 0.58925E-03 14.0  8 -0.18625E-02 0.10707E-02 0.21483E-02 299.8  9 -0.67691E-03 -0.42131E-04 0.67822E-03 266.4  10 -0.22774E-03 -0.71201E-03 0.74755E-03 197.7	
MAX=-0.77170E-01 MIN=-0.10473E 00 PEAK TO PEAK/2= 0.13784	E-01
5.0000E-01 [	
2.9999E-01 = 1   1   1   1   1   1   1   1   1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1.0000E-01 $\frac{\frac{1}{1}}{\frac{1}{1}}$	I I I I
-1.0000E-01	I I I I I I
-3.0000E-01	I I I I
-5.0000E-01	i 360

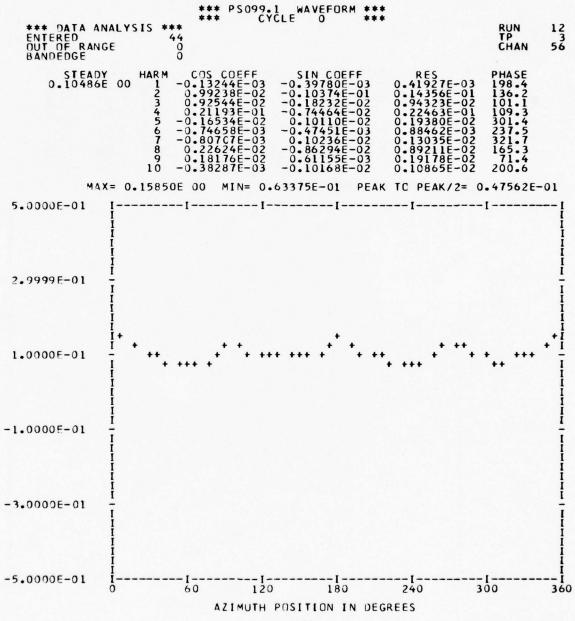


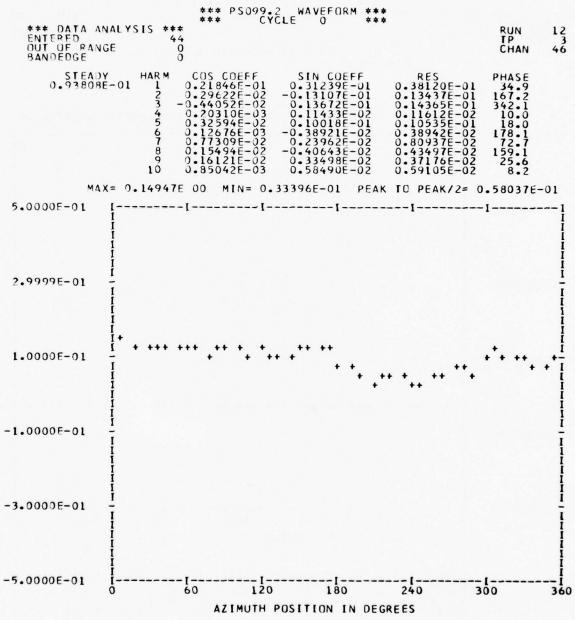
• • • • • • • • • • • • • • • • • • • •		ITUN	
	*** PS081.1 WAVEFORM ***  *** CYCLE 0 ***		
*** DATA AN ENTERED OUT OF RANG BANDEDGE	MALYSIS ***	RUN TP CHAN	12 3 54
STEADY -0.61855E	1 -0.14223E-04 -0.28837E-03 0.28872E-03 2 0.61342E-03 -0.11669E-02 0.13183E-02 3 -0.21701E-03 0.14725E-02 0.14884E-02 4 0.11594E-01 -0.14739E-01 0.18753E-01 5 -0.62060E-03 0.36043E-03 0.71768E-03 6 0.16068E-03 -0.81100E-03 0.82676E-03 7 0.31293E-03 0.78339E-03 0.82676E-03 8 -0.60217E-03 -0.64878E-02 0.65157E-02 9 0.15840E-03 0.12358E-03 0.20091E-03 10 -0.32638E-03 -0.56022E-03 0.64837E-03	PHASE 182.8 152.2 351.6 141.8 300.1 168.7 21.7 185.3 210.2	
MAX	(=-0.30316E-01 MIN=-0.77947E-01 PEAK TC PEAK/2= 0		
5.0000E-01		1	I I I I I
1.0000E-01			1
-1.0000F-01	I I I I I I I I I I I I I I	*** ***	++1
-3.0000E-01			111111
-5.0000E-01	i I I I I I I I I I I I I I I I I I I I	<b>!</b>	I I I I I I I I I I I I I I I I I I I
	AZIMUTH PUSITION IN DEGREES		

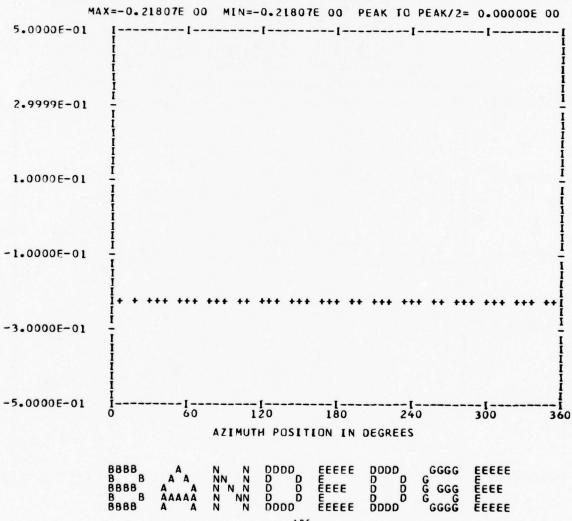


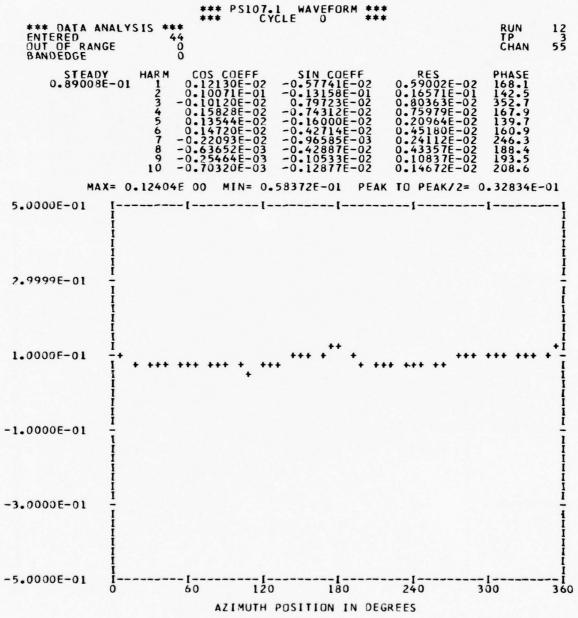


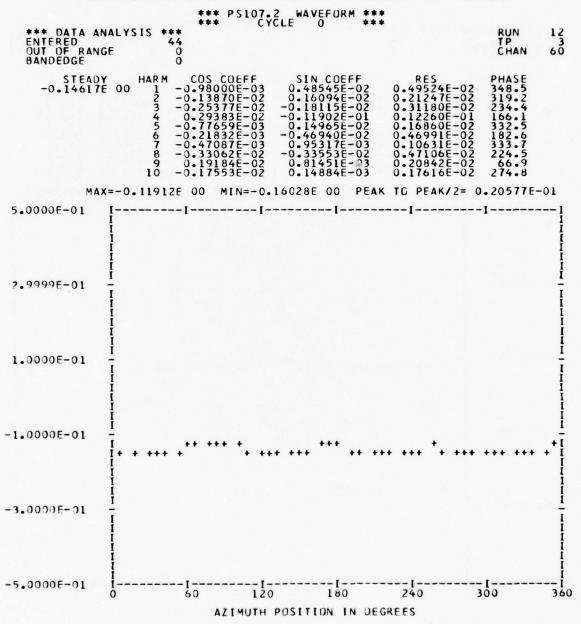


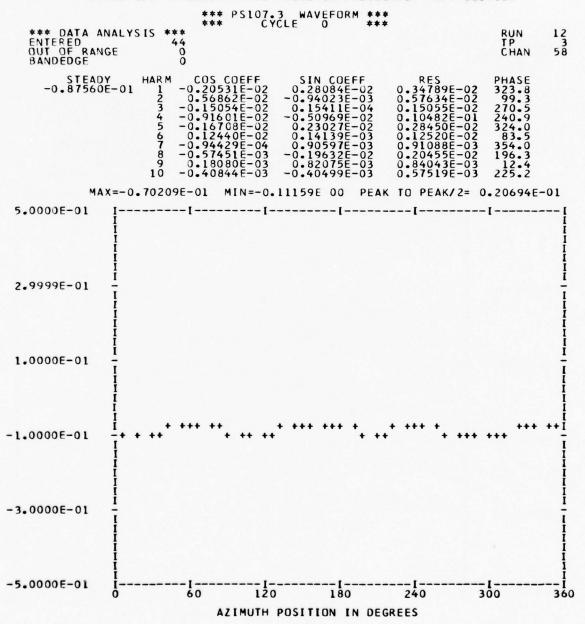


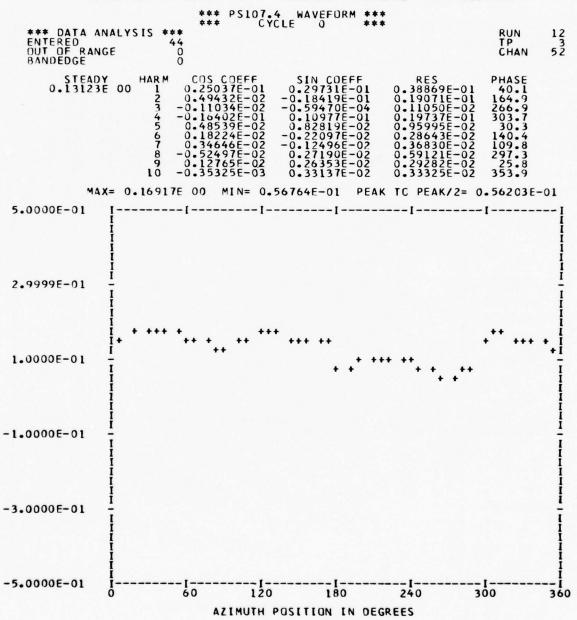


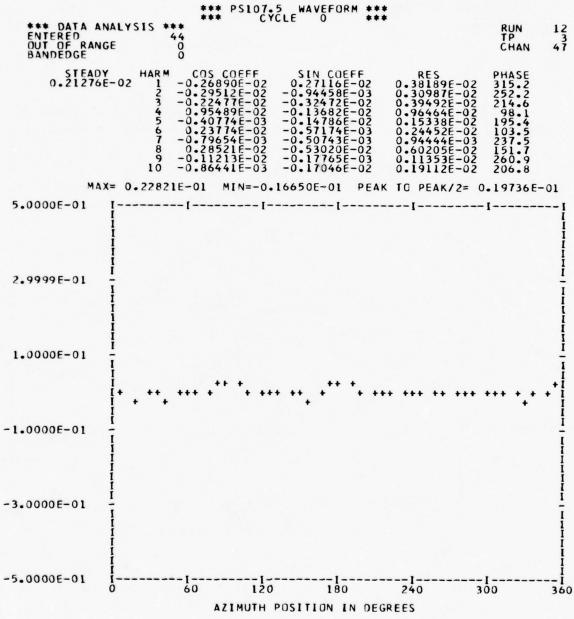










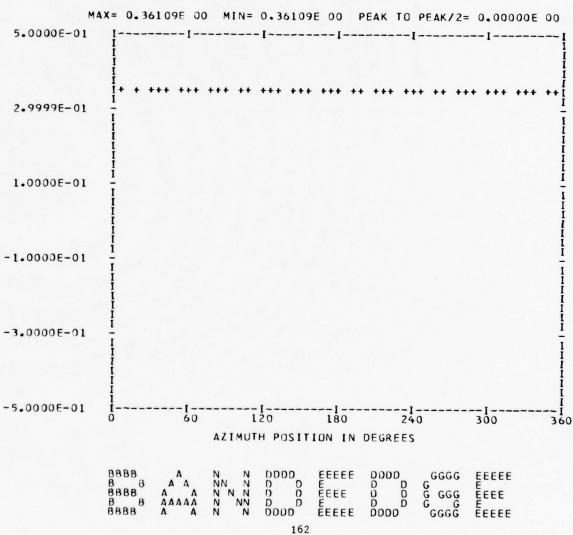


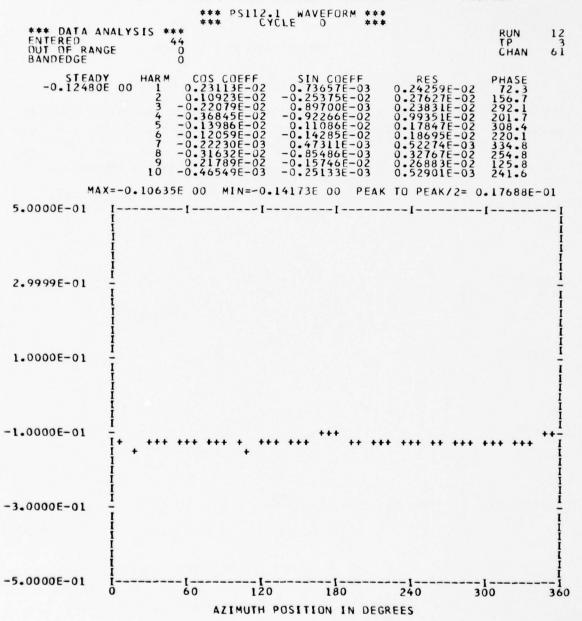
\*\*\* PS107.6 WAVEFORM \*\*\*

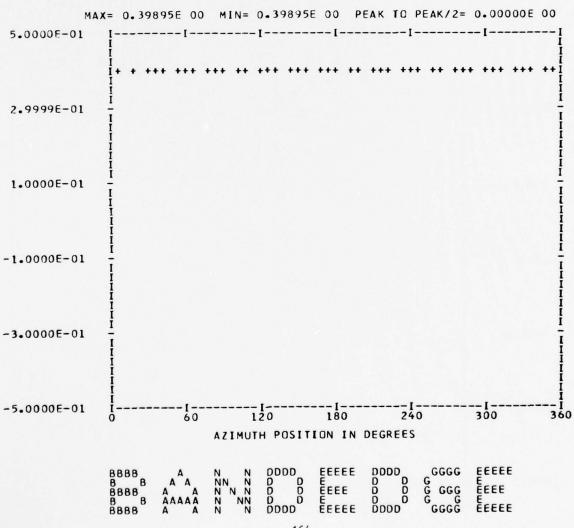
\*\*\* CYCLE 0 \*\*\* \*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

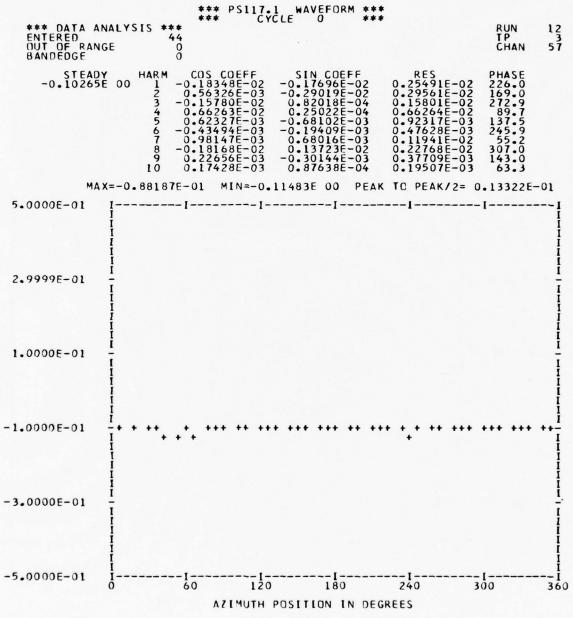
RUN TP CHAN

HARMONIC ANALYSIS SKIPPED

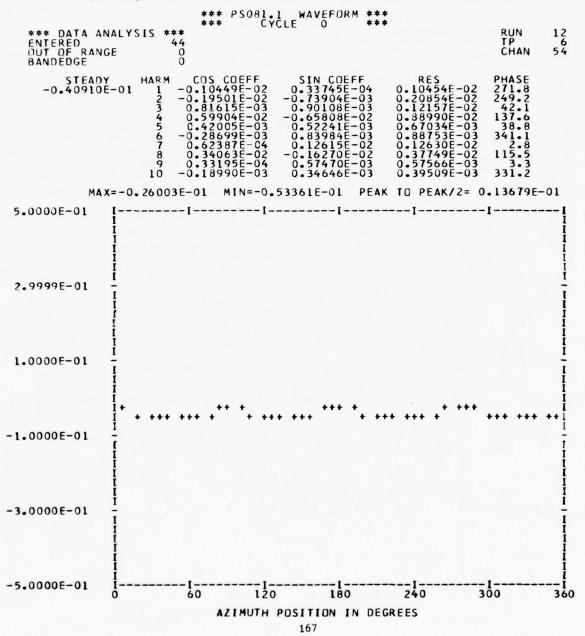


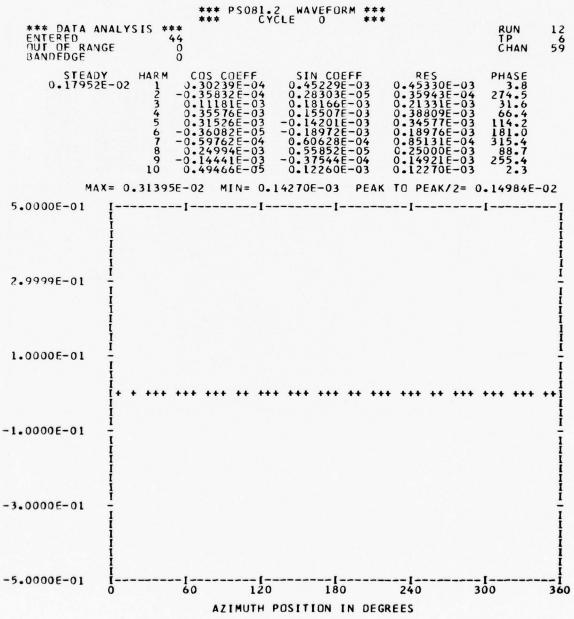


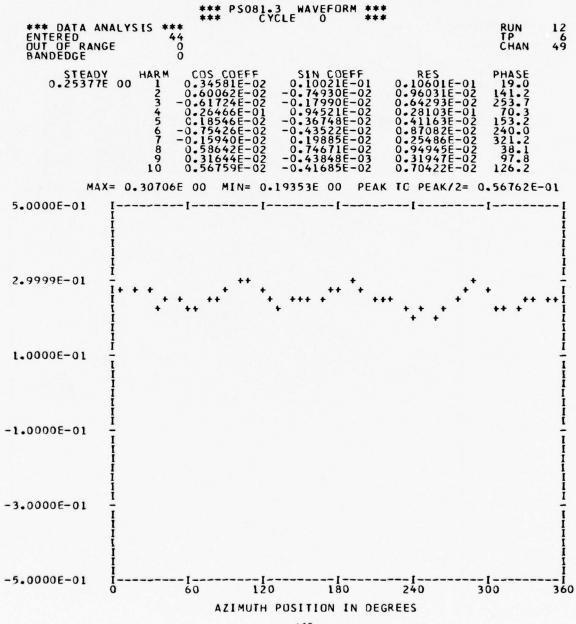


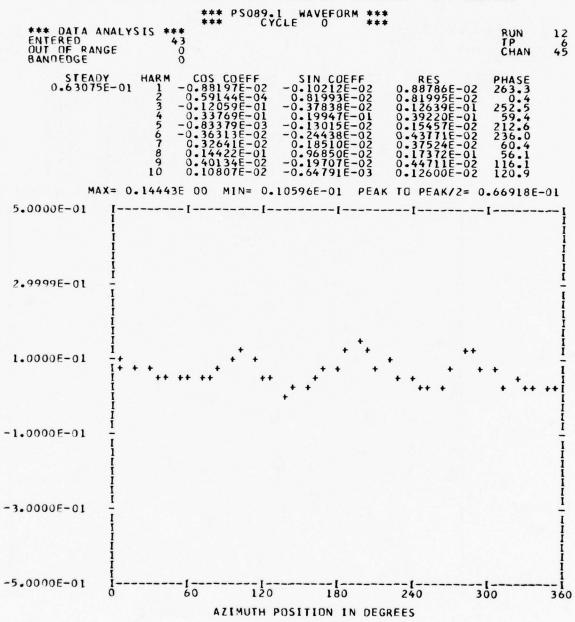


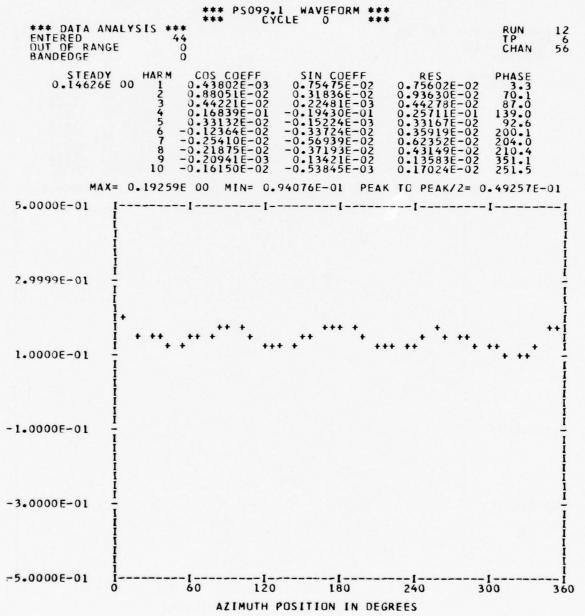
	*** PS	CYCLE WAV	EFORM ***			
*** DATA ANALYS ENTERED OUT OF RANGE BANDEDGE		CYCLE			RUN TP CHAN	12 3 53
STEADY -0.61444E 00	HARM COS COE 1 0.10780E 2 -0.19312E 3 -0.46924E 4 0.32088E 5 0.31016E 6 -0.60436E 7 -0.17075E 8 -0.18806E 9 0.16632E 10 -0.33528E	-02 -0.22 -02 -0.71 -03 -0.83 -03 0.12 -04 -0.20 -03 0.15 -02 -0.13 -03 -0.16	COEFF 462E-02 439E-03 967E-03 933E-03 596E-03 867E-03 254E-04 254E-02 217E-03 357E-03	RES 0.24915E-02 0.20591E-02 0.96189E-03 0.33494E-02 0.33476E-03 0.21725E-03 0.17146E-03 0.23008E-02 0.23230E-03 0.39224E-03	PHASE 154.3 249.7 209.1 73.3 67.8 196.1 275.2 234.8 134.2 301.2	
		I=-0.62384E		TC PEAK/2= 0		01
2.9999E-01 I I I I I I I I I I I I I I I I I I	I		I	[	I	
1.0000E-01						
-1.0000E-01 - I I I I I I I I I I I I I I I I I I						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-3.0000E-01 - I						I I I I I
-5.0000E-01 I	60	120	180		00	360
	AZIM	IUTH POSITIO	ON IN DEGR	EES		

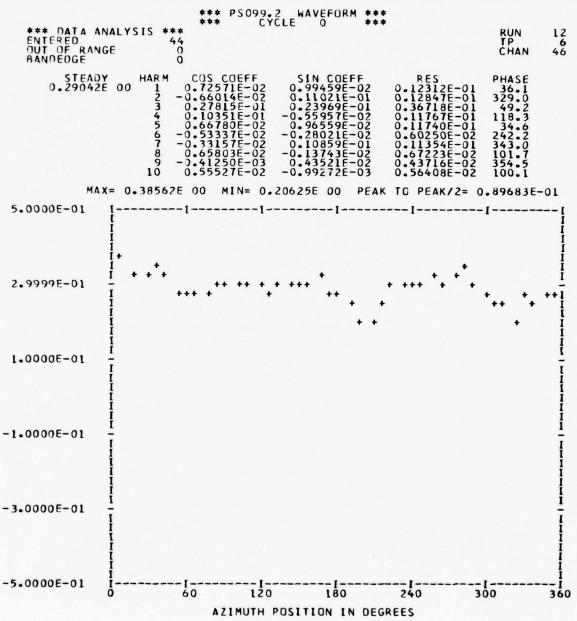






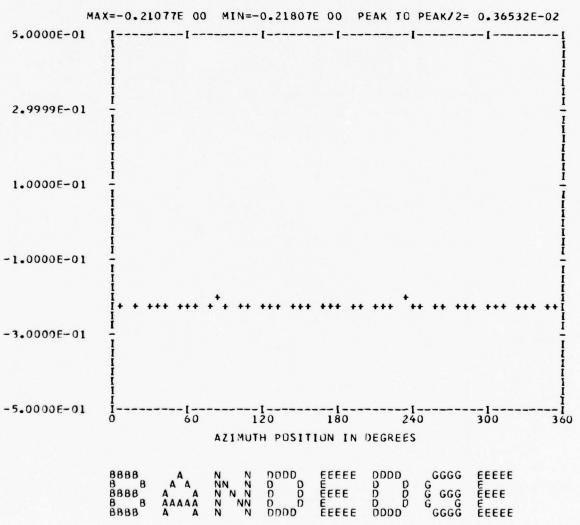


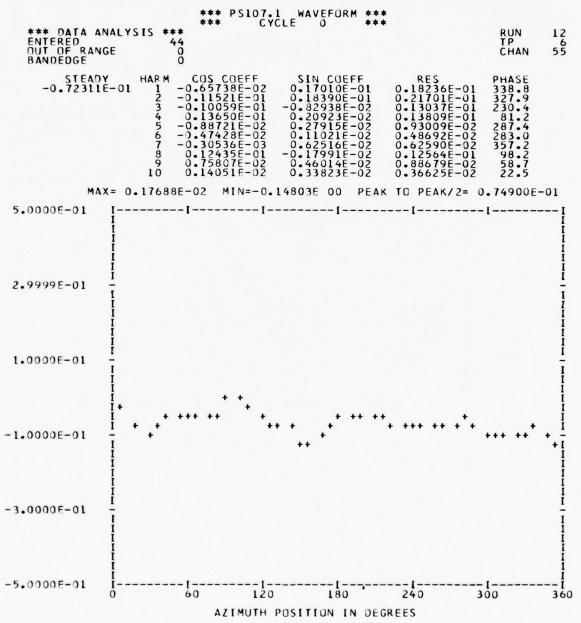


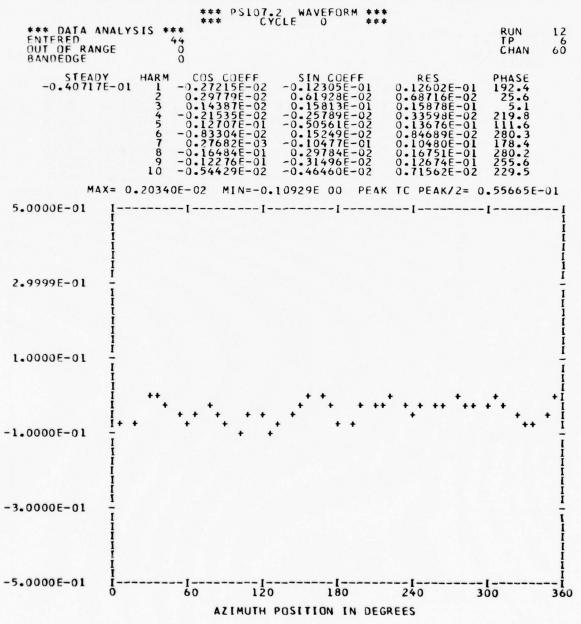


\*\*\* PS099.3 WAVEFORM \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 26
HARMONIC ANALYSIS SKIPPED



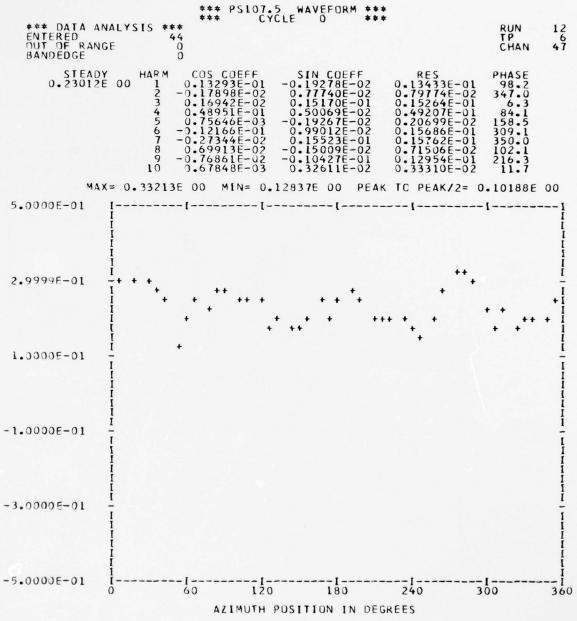




	*** PS107.3 WAVEFORM ***		
*** DATA AND ENTERED OUT OF RANGE BANDEDGE	44	RUN TP CHAN	12 6 58
STEADY -0.15003E	HARM COS COEFF SIN COEFF 0.27960E-01 0.27960E-01 0.30723E-02 0.68861E-02 0.30723E-02 0.22146E-01 0.23845E-01 0.23845E-01 0.331330E-02 0.22146E-01 0.33130E-02 0.22146E-01 0.34345E-02 0.74265E-02 0.10146E-01 0.44384E-02 0.82073E-02 0.93306E-02 0.47365E-02 0.2068E-02 0.47602E-02 0.2068E-02 0.47602E-02 0.87992E-02 0.41509E-02 0.97291E-02 10 -0.16974E-02 -0.656633E-03 0.18199E-02	PHASE 235.5 63.5 98.6 110.5 42.9 208.4 65.0 266.8 295.2 248.8	
MAX	=-0.85825E-01 MIN=-0.23678E 00 PEAK TC PEAK/2= 0.	75478E-	01
5.0000E-01	[		I I I I I
2.9999E-01			I - 1 I I I I I I I I I I I I I I I I I
1.0000E-01			1 - 1 1 1
-1.0000E-01 -		*· •.•	I  1 1 1 1
-3.0000E-01			<u> </u>
-5.0000E-01	I I	0	I 360
	AZIMUTH POSITION IN DEGREES		

0	175	***	PS107.4	WAVEFORM **		SECTION	
*** DATA AN ENTERED OUT OF RANG BANDEDGE		*** 44 0 0	CYCLE	0 **	•	RUN TP CHAN	12 6 52
STEAD) -0.148968	23 34 55 67 78 9	-0.2449 0.1025 0.2561 0.5153 -0.3740 -0.4406 -0.1754 -0.8452 -0.1652 0.2404	7E-01 - (00 - 01 - 01 - 01 - 01 - 01 - 01	SIN COEFF 0.31651E-02 .70615E-02 1.43199E-02 1.20539E-01 1.57195E-02 1.1801E-01 1.98982E-02 1.51240E-02 1.46985E-02	RES 0.24700E 0.12447E 0.25972E 0.68342E 0.48980E 0.11930E 0.13016E 0.53837E 0.52780E	-01 55.4 -01 80.4 -01 111.7 -02 326.8 -02 244.1 -01 3519.5 -02 342.1 -02 27.1	
	(= 0.5289	91E-01 M				2= 0.99566E-	-01
2.9999E-01		1	1				
1.0000E-01	- - - - - - - - - - - - - - - - - - -		* <b>,</b> * <b>,</b>		· · · · ·	·*.	1 1 1 1 1++1
-1.0000E-01	† + †	.+	•			•••	I I I I I
-3.0000E-01	1 1 1 1 1 1						I I I I I
-5.0000E-01	i	1	120	<u>[</u>	I 240	300	I 360

AZIMUTH POSITION IN DEGREES

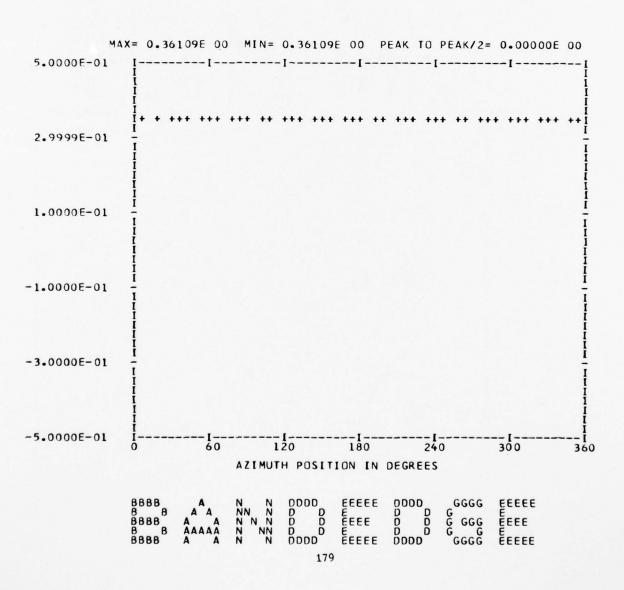


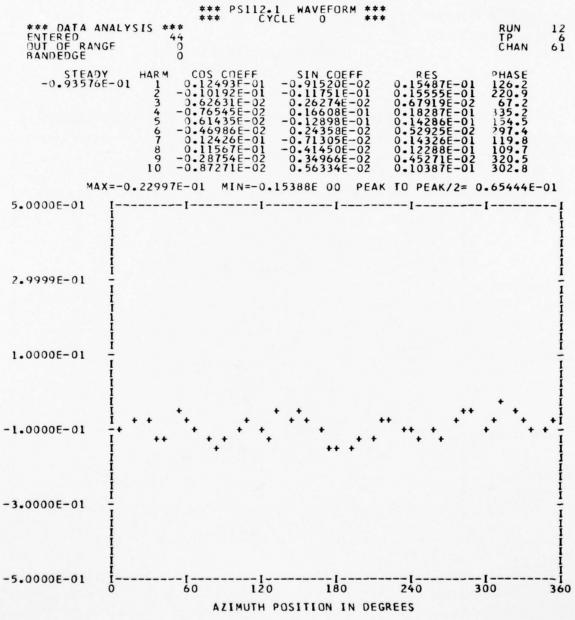
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

\*\*\* PS107.6 WAVEFORM \*\*\*
\*\*\* CYCLE 0 \*\*\*

RUN 12 TP 6 CHAN 50

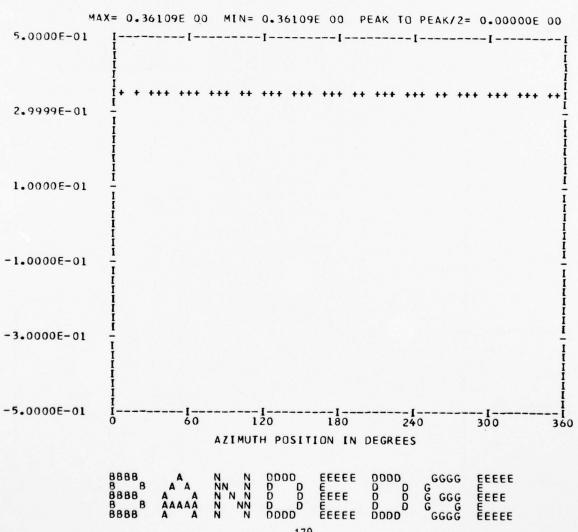
HARMONIC ANALYSIS SKIPPED

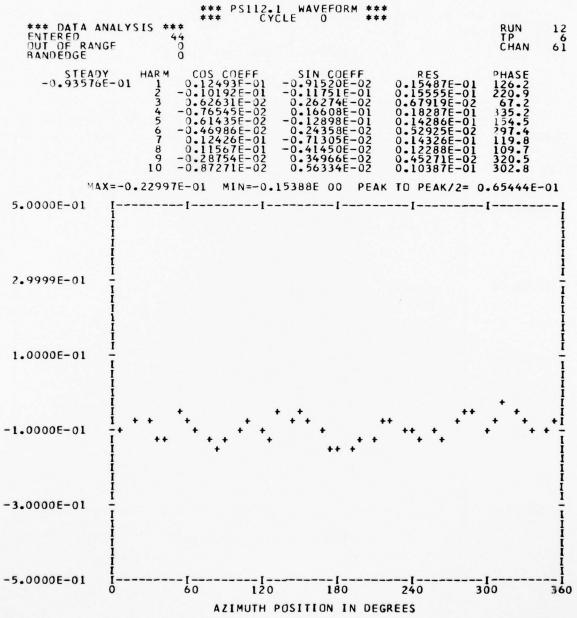




\*\*\* PS107.6 WAVEFORM \*\*\*

CYCLE 0 \*\*\* \*\*\* DATA ANALYSIS \*\*\*
ENTERED
OUT OF RANGE
BANDEDGE
44 HARMONIC ANALYSIS SKIPPED

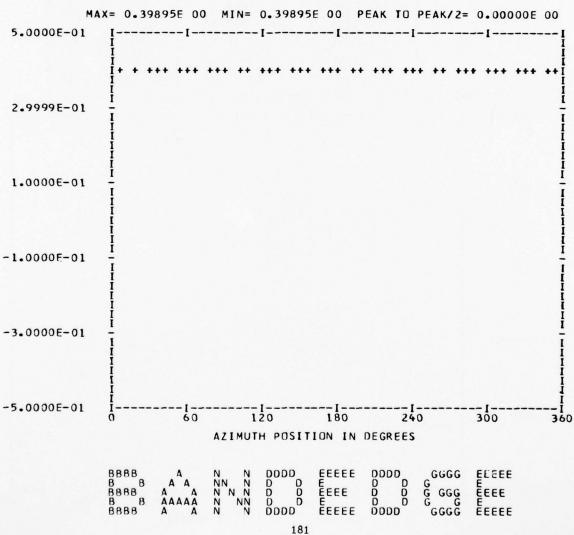


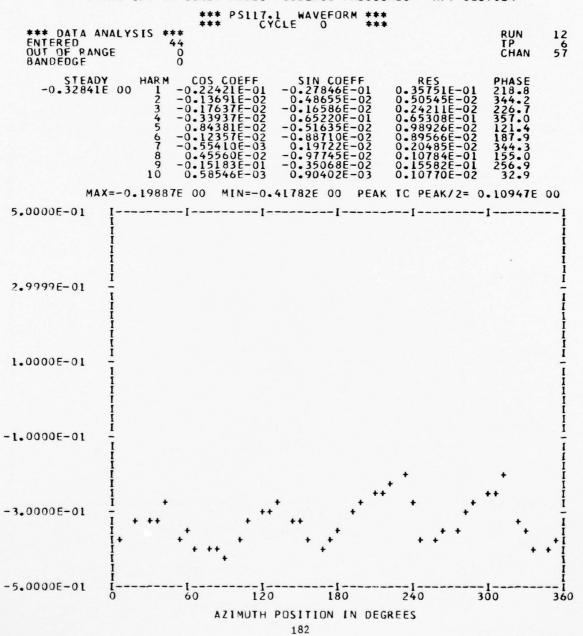


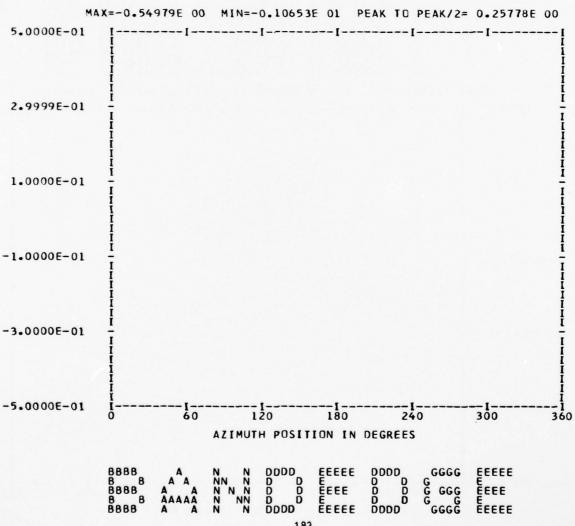
\*\*\* PS112.2 WAVEFORM \*\*\*

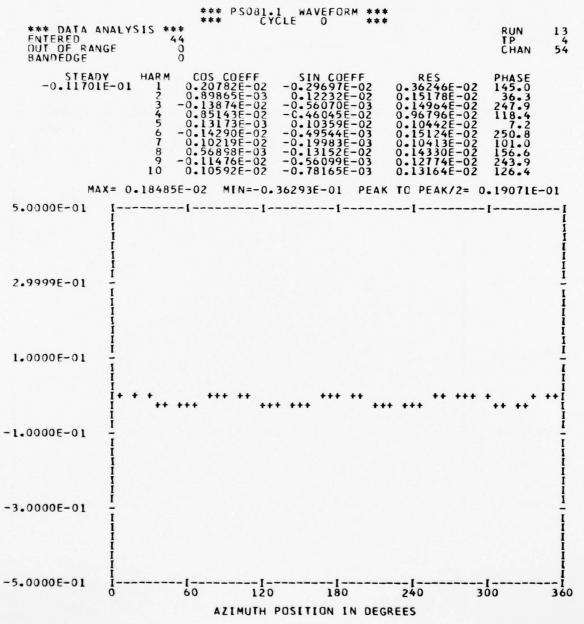
\*\*\* CYCLE 0 \*\*\*

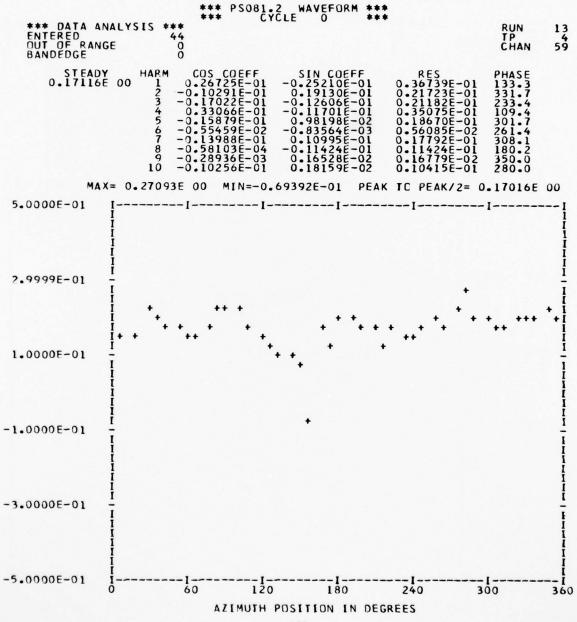
HARMONIC ANALYSIS SKIPPED

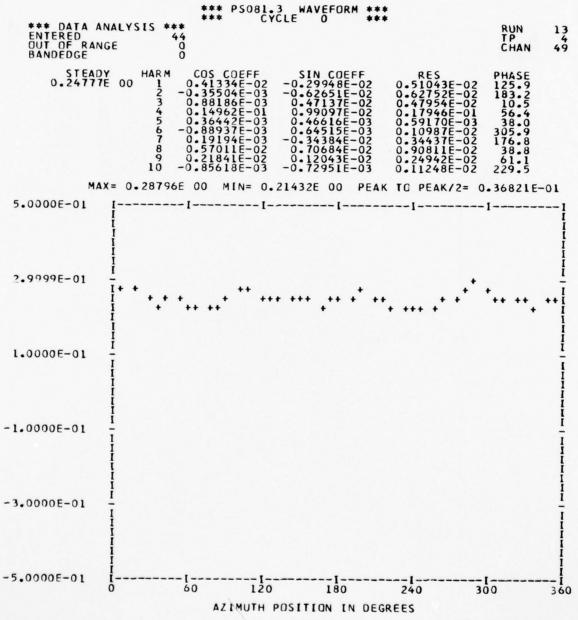


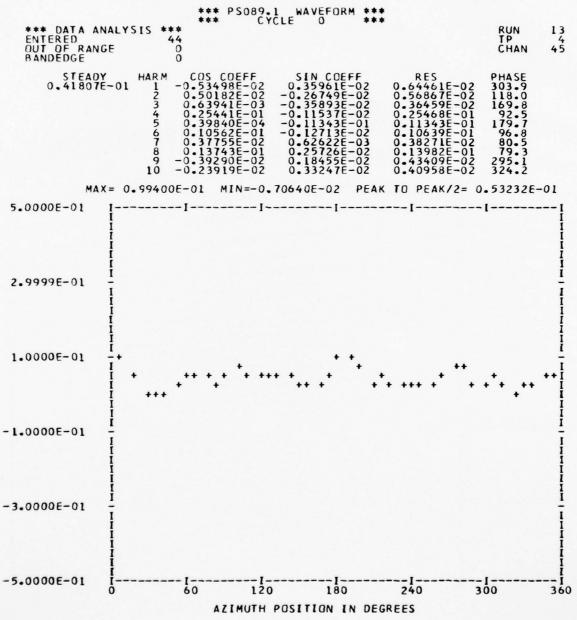






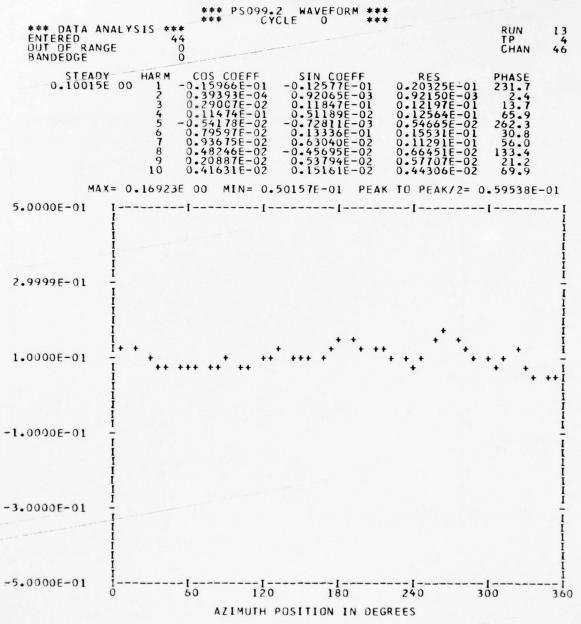


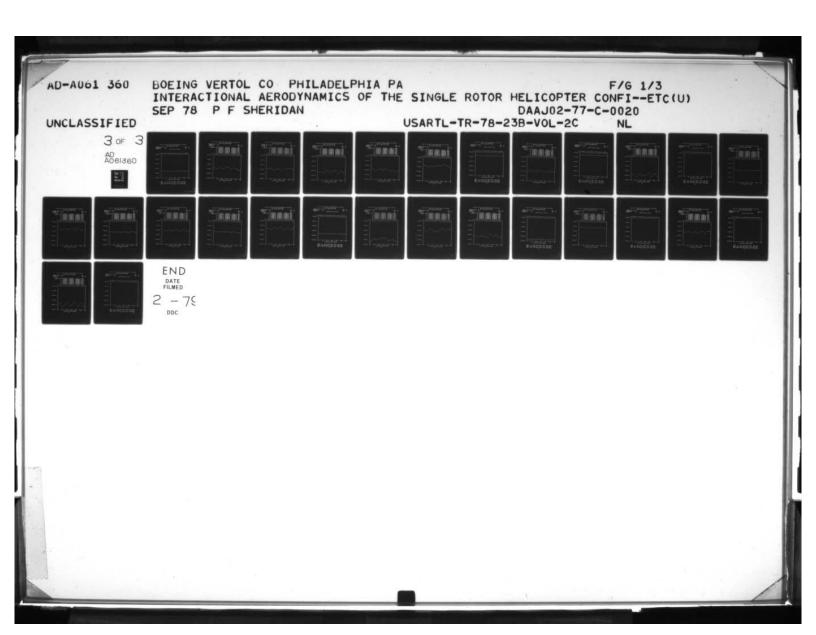




```
*** PS099.1 WAVEFORM ***

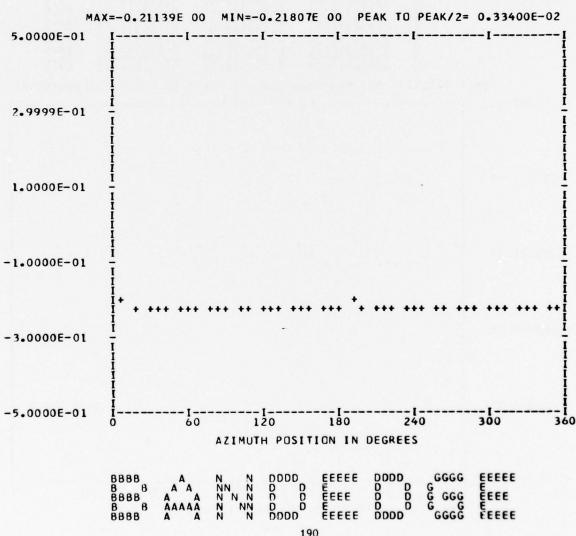
*** CYCLE 0 ***
   *** DATA ANALYSIS ***
ENTERED
OUT OF RANGE OBANDEDGE O
                                                                        RUN
TP
CHAN
      STEADY
0.12037E 00
            MAX= 0.18007E 00 MIN= 0.81315E-01 PEAK TO PEAK/2= 0.49381E-01
 5.0000E-01
               I----I-----I-----I-----I-----I
 2.9999E-01
 1.0000E-01
-1.0000E-01
-3.0000E-01
-5.0000E-01
                                                         240
                          60
                                   120
                                        180
                                                                    300
                              AZIMUTH POSITION IN DEGREES
```





\*\*\* PS099.3 WAVEFORM \*\*\*

\*\*\* CYCLE 0 \*\*\* \*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 19 HARMONIC ANALYSIS SKIPPED

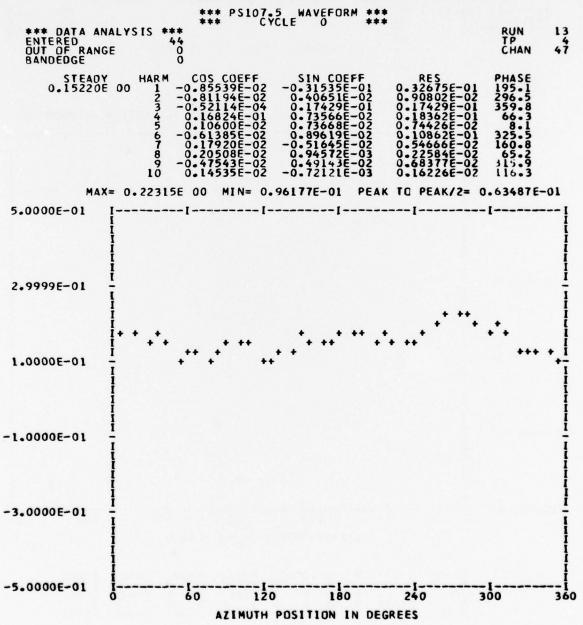


*** PS107.1 WAVEFORM *** *** CYCLE 0 ***		
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	13 4 55
STEADY HARM COS COEFF SIN COEFF 0.24947E-01 0.55204E-02 0.24947E-01 2 -0.49478E-04 0.79673E-02 0.79674E-02 0.79674E-02 0.26779E-01 -0.10716E-01 0.28844E-01 5 -0.18335E-02 0.42217E-02 0.46027E-02 6 -0.79836E-04 0.11426E-01 0.11426E-01 0.1046E-01 0.69343E-02 -0.69820E-02 0.98403E-02 0.32939E-02 0.32939E-02 0.32939E-02 0.32939E-02 0.32939E-02 0.32939E-02 0.32938E-02 0.55113E-02	PHASE 282.7 359.6 334.0 11.8 336.5 1359.5 1359.5 1359.5 282.3	
MAX = 0.60804E-03 MIN=-0.12735E 00 PEAK TO PEAK/2= 0	.63982E-	-01
5.0000E-01	[	
1.0000E-01		1
-1.0000E-01	**• •	***
-3.0000E-01		
-5.0000E-01	l 00	i 360
AZIMUTH POSITION IN DEGREES		

*** PS107.2 WAVEFORM ***  *** CYCLE 0 ***		
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	13 4 60
STEADY HARM COS COEFF SIN COEFF 0.22240E-01 1 0.16651E-01 -0.14743E-01 0.22240E-01 2 -0.11268E-01 -0.58514E-02 0.12697E-01 3 0.333396E-02 0.13102E-01 0.13521F-01 4 -0.19327E-01 -0.91945E-02 0.21403E-01 5 0.71351E-02 0.32624E-02 0.78456E-02 6 0.32108E-02 -0.45808E-02 0.554450E-02 7 0.52909E-02 0.65826E-02 0.84453E-02 8 -0.33598E-02 0.96896E-03 0.34967E-02 9 0.62839E-02 0.96896E-03 0.62865E-02 10 -0.77906E-02 0.34623E-02 0.85253E-02	PHASE 131.5 242.5 144.5 244.5 144.9 286.0 88.3 293.9	
MAX=-0.35392E-01 MIN=-0.15296E 00 PEAK TO PEAK/2= 0.		01
2.9999E-01	( <b></b>	
1.0000E-01 - I I I I I I I I I I I I I I I I I I	.* *	++1
I + + + + + I I I I I I I I I I I I I I		
-3.0000E-01 - I I I I I I I I I I I I I I I I I I		
-5.0000E-01 IIIIIII	0	360
AZIMUTH POSITION IN DEGREES		

	*** PS107.3 WAVEFORM *** *** CYCLE 0 ***	
*** DATA ANA ENTERED OUT OF RANGE BANDEDGE	LYSIS *** 44	RUN 13 TP 4 CHAN 58
STEADY -0.14471E	2  0.13484E-01  -0.10431E-02  0.1 3  0.53427E-02  -0.18055E-01  0.1 4  0.75194E-02  0.32735E-01  0.3 5  0.13460E-01  -0.82132E-02  0.1 6  -0.43447E-02  -0.48480E-02  0.6 7  -0.13465E-01  -0.48823E-03  0.1 8  -0.29596E-02  0.19755E-02  0.3 9  0.10199E-01  -0.58886E-02  0.1 10  -0.34070E-02  0.51467E-03  0.3	RES 8575E-01 272.0 3524E-01 94.4 8829E-01 163.5 3587E-01 12.9 5768E-01 121.3 5100E-02 221.8 3474E-01 267.9 5584E-02 303.7 1777E-01 119.9 4456E-02 278.5
		PEAK/2= 0.79636E-01
5.0000E-01	IIIII-	
2.9999E-01		
1.0000E-01		
-1.0000E-01	* • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
-3.0000E-01		
-5.0000E-01	AZIMUTH POSITION IN DEGREES	

*** DATA ANALYSIS ***	*** *** RUN 13
ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	TP 4 CHAN 52
STEADY HARM COS COEFF 0.29162E-0 -0.97010E-01 1 -0.23648E-01 0.29162E-0 2 0.71949E-02 0.75088E-0 3 0.14238E-01 0.18056E-0 4 0.39312E-01 0.73952E-0 5 0.45005E-02 0.78460E-0 6 -0.37692E-02 0.70136E-0 7 -0.98902E-02 0.35086E-0 8 -0.42281E-02 0.53525E-0 9 0.28689E-02 -0.36794E-0 10 0.16613E-02 0.75912E-0	01 0.37545E-01 320.9 02 0.10399E-01 43.7 02 0.14352E-01 82.7 03 0.45684E-02 80.1 02 0.79622E-02 331.7 02 0.10494E-01 289.5 02 0.68210E-02 321.6 02 0.46657E-02 142.0 02 0.77708E-02 12.3
MAX=-0.29706E-01 MIN=-0.20942E 00 F	PEAK TO PEAK/2= 0.89859E-01
2.9999E-01	
1.0000E-01	
-1.0000E-01	· · · · · · · · · · · · · · · · · · ·
-3.0000E-01	
-5.0000E-01 I	240 300 360 DEGREES

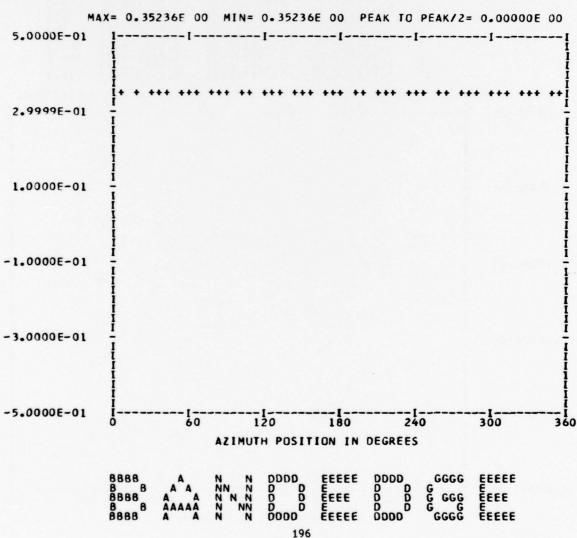


\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

\*\*\* PS107.6 WAVEFORM \*\*\*
CYCLE 0 \*\*\*

RUN TP CHAN

HARMONIC ANALYSIS SKIPPED



*** PS112.1 WAVEFORM ***  *** CYCLE 0 ***						
*** DATA ANA ENTERED OUT OF RANGI BANDEDGE	ALYSIS **	**************************************	CLE 0 **:		RUN TP CHAN	13 61
-0.90275E-	23 45 67 89 10	COS COEFF 0.888860E-02 0.54833E-02 0.32318E-02 -0.61533E-02 0.13450E-01 -0.91103E-02 0.29083E-02 0.80940E-02 -0.97683E-03 0.97044E-02	SIN COEFF 0.68053E-02 -0.19352E-01 0.14612E-01 -0.53715E-02 -0.24262E-02 -0.75811E-02 -0.73972E-02 0.16388E-02 0.85864E-02	RES 0.11192E-01 0.20114E-01 0.14965E-01 0.13667E-01 0.11852E-01 0.29169E-02 0.10965E-01 0.19078E-02 0.12957E-01	PHASE 52.51 164.1 128.8 100.2 230.2 132.4 132.4 329.2 48.4	
	-0.11129	E-01 MIN=-0.		K TC PEAK/2= 0	•77397E-	-01
2.9999E-01			I			
1.0000E-01	•		٠.			I I I I
-1.0000E-01	+ +++	** ** **	• • • • • • • •		**. *.*	++İ
-3.0000E-01						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-5.0000E-01	<u></u>	-II- 120	180	240 3	00	ii 360
		AZIMUTH	POSITION IN DEC	GREES		
			197			

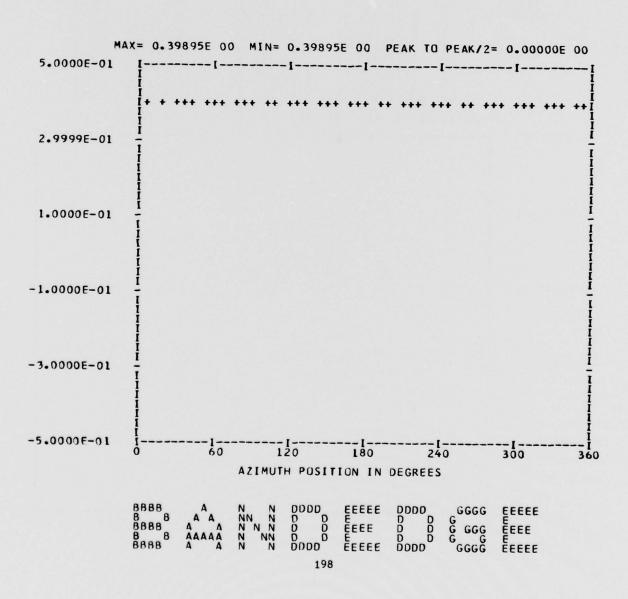
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0

\*\*\* PS112.2 WAVEFORM \*\*\*

CYCLE 0 \*\*\*

RUN 13 TP 4 CHAN 48

HARMONIC ANALYSIS SKIPPED



*** PS117.1 _WAVEFORM ***	rion	
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	13 4 57
STEADY	PHASE 207.7 242.5 174.0 354.6 38.0 206.5 108.3 226.6	
MAX=-0.18816E 00 MIN=-0.37268E 00 PEAK TC PEAK/2= 0	•92261E-	-01
5.0000E-01	[ <del></del>	
1.0000E-01		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-1.0000E-01	•	I I I I I
-3.0000E-01	**	- L - L - L - L - L - L - L
-5.0000E-01 II 1 1 240 3  AZIMUTH POSITION IN DEGREES	1	i 360

\*\*\* PS117.2 WAVEFORM \*\*\*

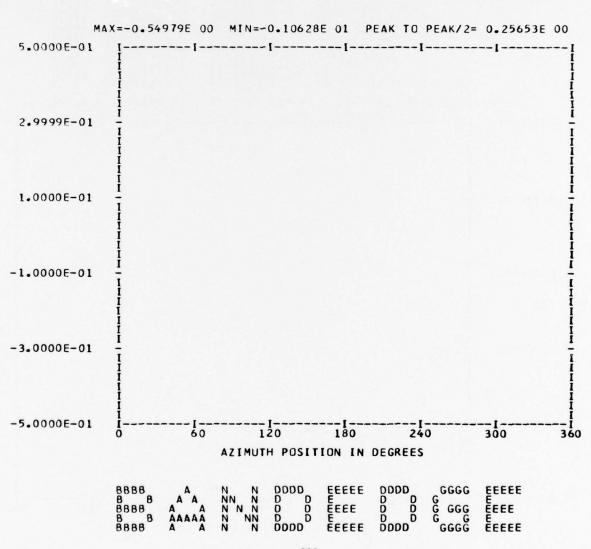
\*\*\* DATA ANALYSIS \*\*\*

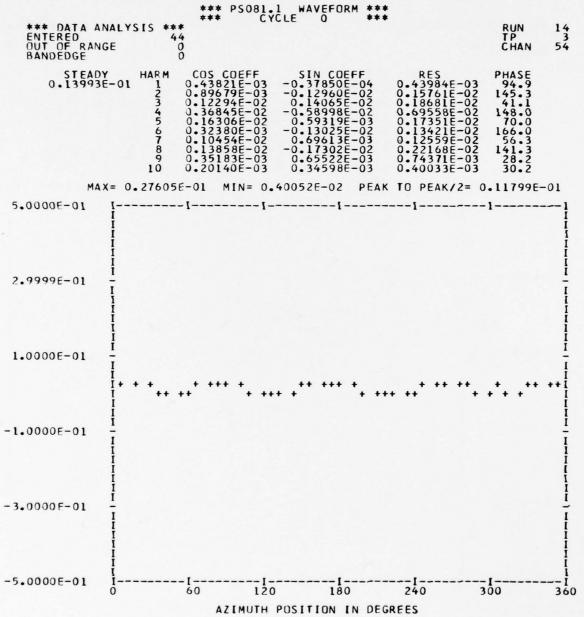
FNIERED 44

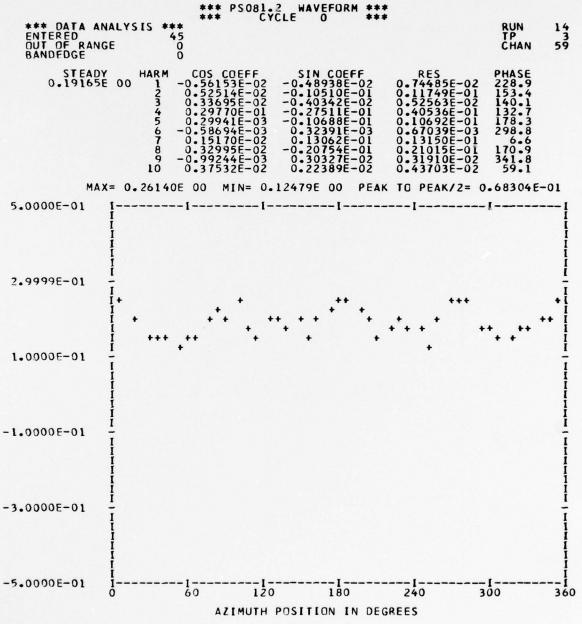
OUT OF RANGE 44

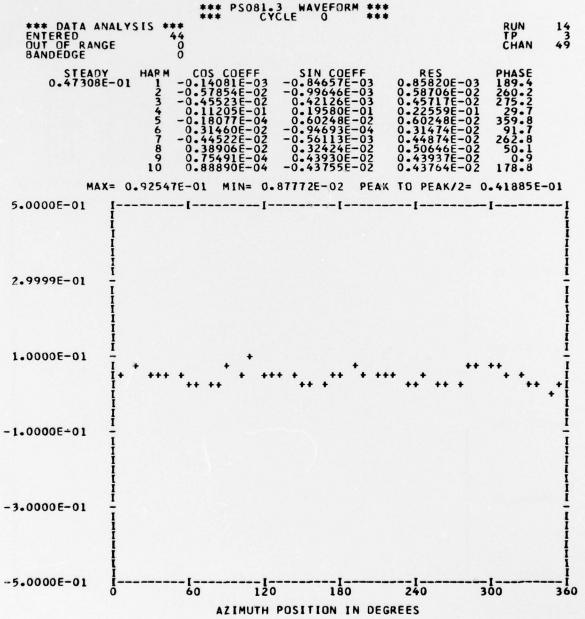
BANDEDGE 36

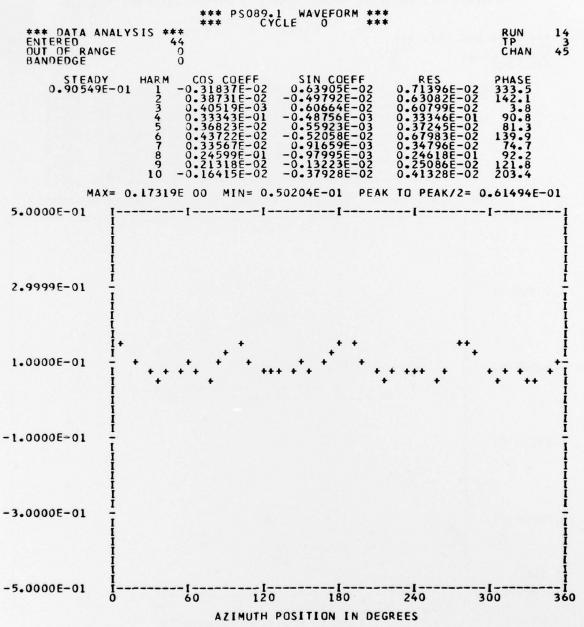
HARMONIC ANALYSIS SKIPPED

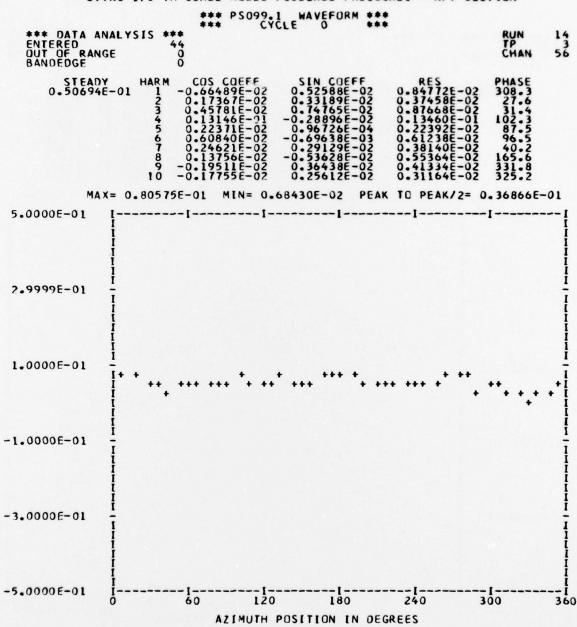


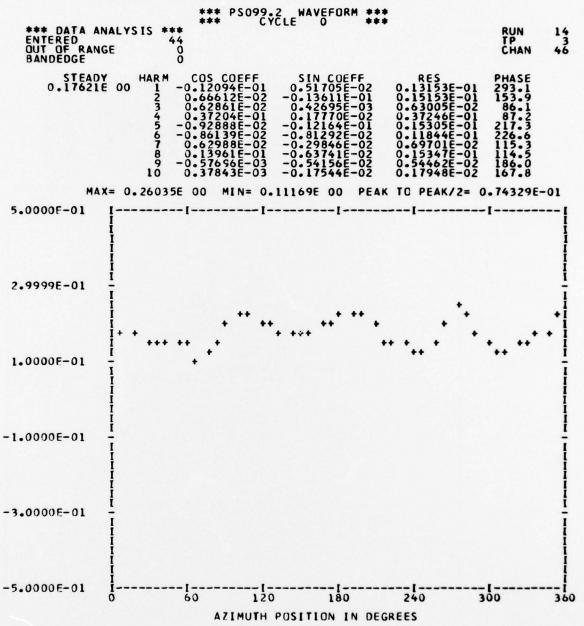










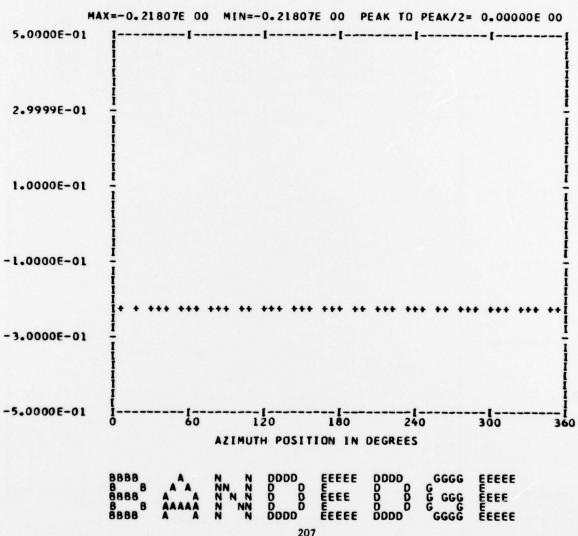


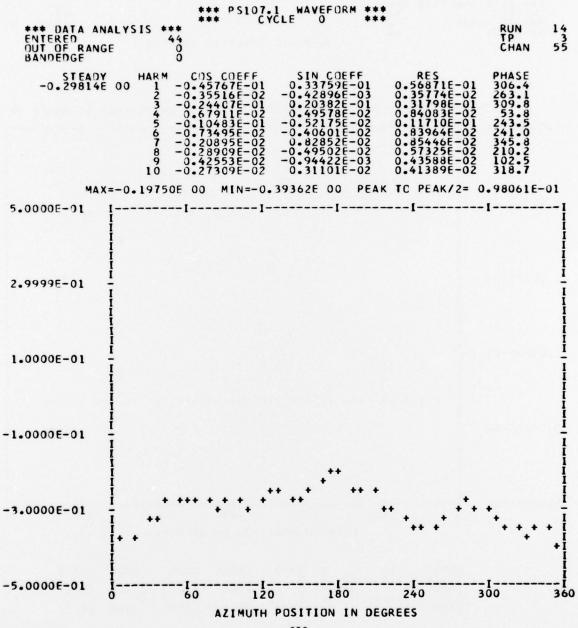
\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

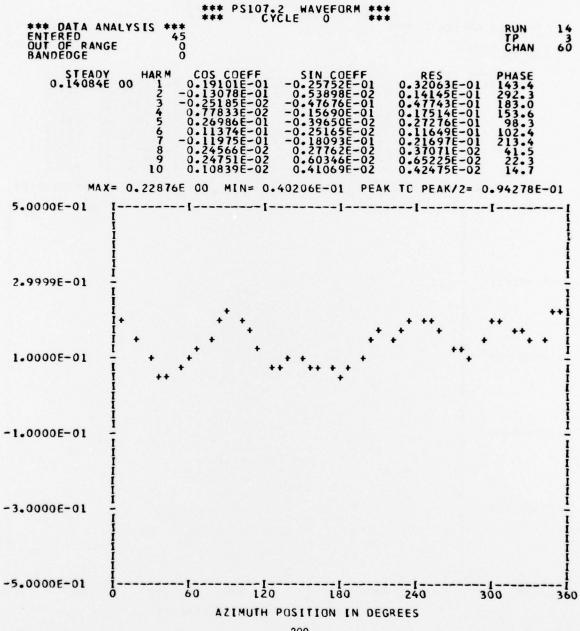
C10EE 0 +++

RUN 14 TP 3 CHAN 51

HARMONIC ANALYSIS SKIPPED







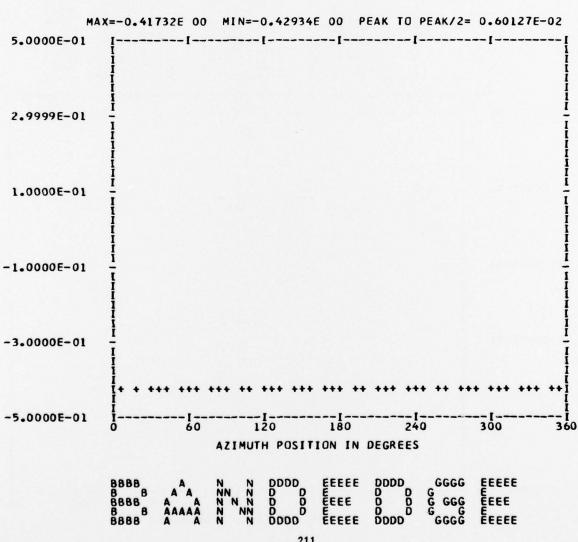
*** PS107.3 WAVEFORM ***  *** CYCLE 0 ***					
*** DATA ANALYSIS *** ENTERED 44 OUT OF RANGE 0 BANDEDGE 0	RUN TP CHAN	14 3 58			
STEADY HARM COS COEFF SIN COEFF 0.24348E-01 0.24348E-01 2 -0.36222E-02 0.18056E-01 0.18416E-01 0.21713E-02 -0.22042E-01 0.22149E-01 0.2211713E-02 -0.22042E-01 0.22149E-01 0.22011E-01 0.92401E-02 0.23872E-01 5 0.19902E-01 -0.13065E-01 0.23808E-01 6 -0.59852E-02 0.15762E-02 0.61893E-02 7 0.48579E-02 0.80579E-02 0.94090E-02 8 -0.14624E-01 0.55669E-02 0.15647E-01 9 0.29537E-03 0.41848E-02 0.41952E-02 10 -0.31002E-02 -0.16328E-02 0.35039E-02	PHASE 207-0 348-6 174-2 123-2 284-7 148-9 290-8 4-0 242-2				
MAX=-0.41897E-01 MIN=-0.21634E 00 PEAK TO PEAK/2= 0 5.0000E-01 [	.87222E-	01			
2.9999E-01					
-1.0000E-01	···	+ 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1			
-3.0000E-01		-			
-5.0000E-01	00	1 360			
AZIMUTH POSITION IN DEGREES					

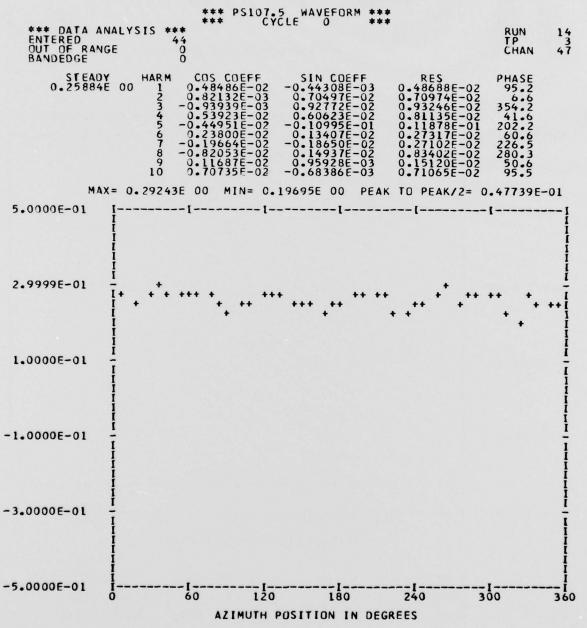
\*\*\* PS107.4 WAVEFORM \*\*\*

CYCLE 0 \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 0
BANDEDGE 44

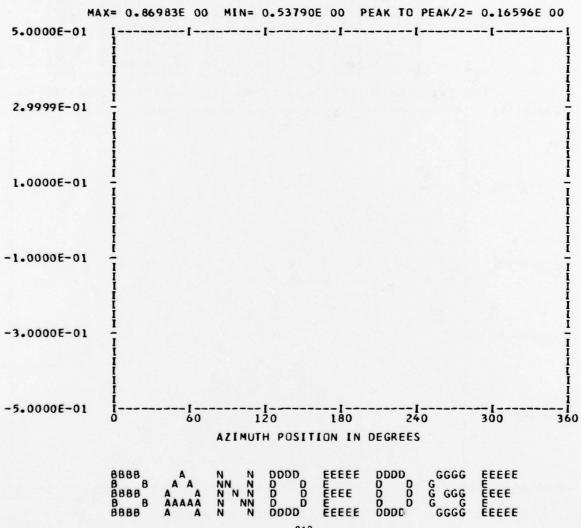
HARMONIC ANALYSIS SKIPPED





\*\*\* PS107.6 WAVEFORM \*\*\*

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 44
BANDEDGE 44
HARMONIC ANALYSIS SKIPPED

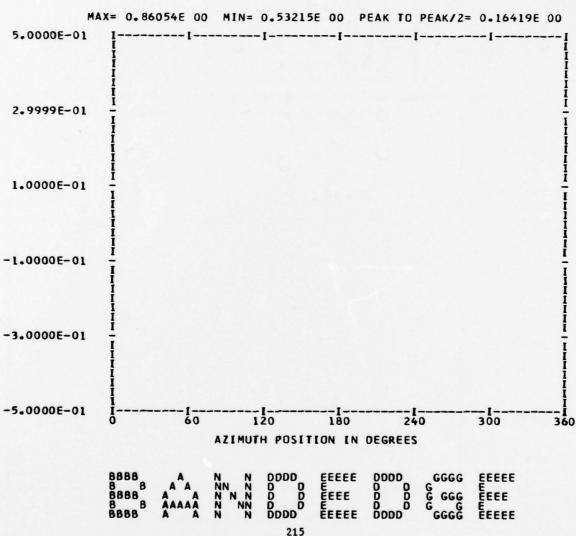


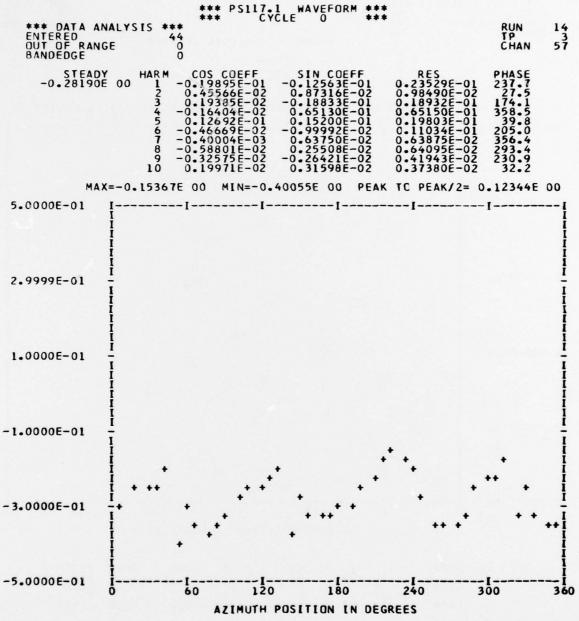
UTT	AS 1/5 TH SCALE MODEL FUSELAGE PRESSURESAFT SECT	ION	
*** DATA AN ENTERED OUT OF RANG BANDEDGE	45	RUN TP CHAN	14 3 61
STEADY 0.73189E	HARM COS COEFF 01 COEFF 0.84009E-02 0.15957E-01 2 0.76258E-02 -0.50718E-02 0.91584E-02 0.9	PHASE 121.7 123.6 216.7 265.3 81.1 97.1 196.2 194.7 60.0 16.7	
MAX	= 0.15167E 00 MIN= 0.13628E-02 PEAK TO PEAK/2= 0.	75154E-	01
5.0000E-01 2.9999E-01	I [ [ ]		I I I I I I I I I
1.0000E-01		. *	
-1.0000E-01			<u> </u>
-3.0000E-01			I I I I I
-5.0000E-01	I I I I I I I I I I I I I I I I I I I	0	I 360

\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 44
BANDEDGE 44

\*\*\* PS112.2 WAVEFORM \*\*\*
\*\*\* CYCLE 0 \*\*\*

HARMONIC ANALYSIS SKIPPED





\*\*\* DATA ANALYSIS \*\*\*
ENTERED 44
OUT OF RANGE 43
BANDEDGE 36

RUN TP CHAN

HARMONIC ANALYSIS SKIPPED

